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AD-A259 648



Albuquerque District

RIO GRANDE FLOODWAY

Truth or Consequences Unit, NM



CUCHILLO NEGRO DAM

FOUNDATION REPORT, Volume II
Appendix B, Appendix C, and Appendix D

CONSTRUCTION FOUNDATION REPORTS
ER 1110-1-1801

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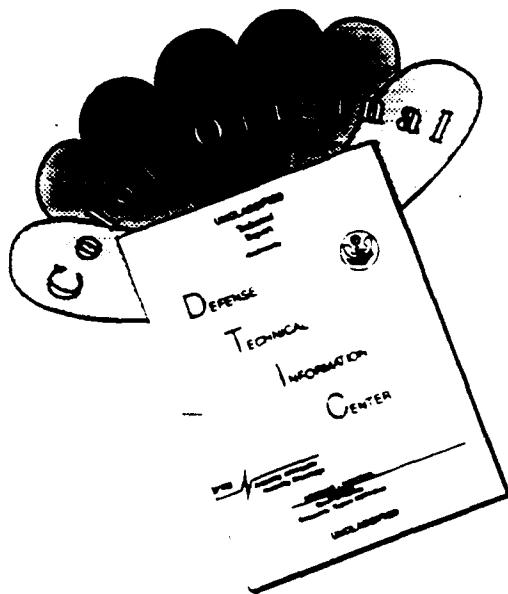
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SECURITY CLASSIFICATION OF THIS PAGE

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4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
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12. PERSONAL AUTHOR(S) Christopher B. DeWitt, Geologist, Albuquerque District					
13a. TYPE OF REPORT Final Foundation Report		13b. TIME COVERED FROM 11/89 to 7/91		14. DATE OF REPORT (Yr, Month, Day) December 1992	
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16. SUPPLEMENTARY NOTATION Rio Grande Floodway, Truth or Consequences, NM					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Cuchillo Negro Dam, NM RCC Dam, Earth Embankment, Auxiliary Spillway		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Cuchillo Negro Dam was completed in July 1991. The project, which is a dry, flood control only reservoir, consists of a main dam and an auxiliary spillway. The dam consists of a 750-foot-long earth embankment section and a 590-foot-long roller compacted concrete (RCC) section. The crest of the earth embankment section is 21 feet wide, and it is 25 feet wide for the RCC section. The dam has an overflow spillway and rises 134 feet above the channel bottom. The auxiliary spillway is an RCC lined spillway with a conventional concrete Ogee. It is 680 feet wide and extends from a point 260 feet from the right abutment of the RCC dam in a southeasterly direction. Numerous unanticipated geologic conditions were encountered during excavation of the foundation trench. This led to design changes and modifications to the contract.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> FOR USERS				21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a. NAME OF RESPONSIBLE INDIVIDUAL Christopher B. DeWitt				22b. TELEPHONE (Include Area Code) (505) 766-2713	
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APPENDIX B

LOGS OF SUBSURFACE EXPLORATIONS

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**APPENDIX B
TABLE OF CONTENTS**

Exploration No.	Description	Page No.
Pre-Construction Trench Logs		
CN-T-5		B-3
CN-T-6		B-4
CN-T-7		B-5
CN-T-8		B-6
CN-T-9		B-7
CN-T-10		B-8
CN-T-11		B-9
CN-T-12		B-10
CN-T-13		B-11
CN-T-14		B-12
CN-T-15		B-13
CN-T-16		B-14
CN-T-17		B-15
CN-T-18		B-16
Pre-Construction 8-Inch Auger Boring Logs		
CN-8A-1		B-17
CN-8A-2		B-18
CN-8A-3		B-19
CN-8A-4		B-20
CN-8A-5		B-21
CN-8A-6		B-22
CN-8A-7		B-23
CN-8A-8		B-24
CN-8A-9		B-25
CN-8A-10		B-26
CN-8A-11		B-27
CN-8A-12		B-28
CN-8A-13		B-29
CN-8A-14		B-30
CN-8A-15		B-31
CN-8A-16		B-32
Pre-Construction 4-Inch Rotary Boring Logs		
CN-CH-13		B-33
CN-CH-14		B-34
Pre-Construction 6-Inch Denison Boring Log		
CN-D-1		B-35
Pre-Construction NX and HQ Diamond Core Boring Logs		
CN-CH-1		B-40
CN-CH-2		B-45
CN-CH-3		B-48
CN-CH-4		B-52
CN-CH-5		B-56
CN-CH-5A		B-58
CN-CH-6		B-60

APPENDIX B
TABLE OF CONTENTS (cont'd)

Exploration No.	Description	Page No.
CN-CH-7		B-63
CN-CH-7A		B-65
CN-CH-8		B-67
CN-CH-9		B-70
CN-CH-10		B-76
CN-CH-11		B-81
CN-CH-12		B-87
CN-CH-15		B-92
CN-CH-16		B-96
CN-CH-17		B-102
CN-CH-18		B-106
CN-CH-19		B-112
CN-CH-20		B-117
CN-CH-21		B-122
CN-CH-22		B-129
CN-CH-23		B-136
CN-CH-24		B-141
CN-CH-25		B-143
CN-CH-26		B-147
CN-CH-27		B-152
CN-CH-28		B-155
CN-CH-29		B-159
CN-CH-34		B-166
CN-CH-35		B-169
CN-CH-36		B-170
CN-CH-37		B-171
CN-CH-38		B-173
CN-CH-39		B-176
CN-CH-40		B-181
CN-CH-41		B-190
CN-CH-42		B-195
CN-CH-43		B-198
CN-CH-44		B-202
CN-CH-45		B-204
	Construction 2-Inch Air Percussion Boring Logs	
PH-3		B-207
PH-2		B-208
PH-1		B-210
PH-0		B-211
	Construction 6-Inch Denison Boring Log	
C-37-1		B-212
	Contractor's Water Well Driller's Log	
PCL Well		B-213

PRE-CONSTRUCTION TRENCH LOGS

DRILLING LOG		DIVISION SWD	INSTALLATION Albuquerque District		SHEET OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek			10. SIZE AND TYPE OF BIT --			
2. LOCATION (Coordinates or Station) x= 656,521 ; y= 808,711			11. DATUM FOR ELEVATION SHOWN (FSM = MSL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel			12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-5			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		UNDISTURBED	
			2		0	
5. NAME OF DRILLER Leo Polanco			14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER 4637.8			
7. THICKNESS OF OVERBURDEN --			16. DATE HOLE STARTED 26 Apr 84 COMPLETED 26 Apr 84			
8. DEPTH DRILLED INTO ROCK 0'			17. ELEVATION TOP OF HOLE 4645.0'			
9. TOTAL DEPTH OF HOLE 8.0'			18. TOTAL CORE RECOVERY FOR BORING 0 %			
			19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4645	1'		sandy Gravel, drk brn, 6" max.		#1	
	2'					
	3'					
	4'		sandy Gravel, drk brn, 6" max. w/less +4"			
	5'					
	6'		gravelly Sand w/some clay			
	7'				#2	
	8'					wtr @ 7.2'
	9'					
	10'					
	11'					
	12'					
	13'					
	14'					
	15'					

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PROJECT

Cuchillo Negro Creek

HOLE NO.

CN-T-5

Hole No. CN-T-6

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
		SWD	Albuquerque District	OF 1 SHEETS		
1. PROJECT Cuchillo Negro Creek			10. SIZE AND TYPE OF BIT --			
2. LOCATION (Coordinates or Station) x= 656,413 ; y= 808,433			11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel			12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-6			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 2 UNDISTURBED 0			
5. NAME OF DRILLER Leo Polanco			14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER 4636.3			
7. THICKNESS OF OVERBURDEN --			16. DATE HOLE STARTED 26 Apr 84 COMPLETED 26 Apr 84			
8. DEPTH DRILLED INTO ROCK 0'			17. ELEVATION TOP OF HOLE 4645.0			
9. TOTAL DEPTH OF HOLE 9'			18. TOTAL CORE RECOVERY FOR BORING 0 %			
			19. SIGNATURE OF INSPECTOR <i>Robert J. Morris</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4645			sandy Silt, lt. brn.			
	1'					
	2'		sandy, silty, Gravel to +11"			
	3'					
	4'				#1	
	5'					
	6'					
	7'					
	8'		sandy, silty, Gravel w/some clay		#2	
	9'					wtr @ 8.7'
	10'					
	11'					
	12'					
	13'					
	14'					
	15'					

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PROJECT
Cuchillo Negro Creek

HOLE NO.
CN-T-6

Hole No. CN-T-7

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
		SWD		Albuquerque District		OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek				10. SIZE AND TYPE OF BIT --			
2. LOCATION (Coordinates or Station) x= 656,284 ; y= 808,172				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel				12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-7				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
				DISTURBED		UNDISTURBED	
				2		0	
5. NAME OF DRILLER Leo Polanco				14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER 4635.7			
7. THICKNESS OF OVERBURDEN --				16. DATE MOLE		16. DATE MOLE	
				STARTED		COMPLETED	
				26 Apr 84		26 Apr 84	
8. DEPTH DRILLED INTO ROCK 0'				17. ELEVATION TOP OF MOLE 4645.0'			
9. TOTAL DEPTH OF HOLE 9.5'				18. TOTAL CORE RECOVERY FOR BORING 0 %			
				19. SIGNATURE OF INSPECTOR			
				Signature: [Signature]			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4645			sandy Silt, lt. brn.				
	1'						
	2'		sandy, silty, Gravel to +10"				
	3'						
	4'				#1		
	5'						
	6'						
	7'						
	8'						
	9'		gravelly Sand		#2		
	10'					wtr @ 9.3'	
	11'						
	12'						
	13'						
	14'						
	15'						

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PROJECT
Cuchillo Negro Creek

HOLE NO.
CN-T-7

Hole No. CN-T-8

Drilling Log		DIVISION		INSTALLATION		SHEET	
SWD		Albuquerque District		OF 1 SHEETS			
1. PROJECT Cuchillo Negro Creek				10. SIZE AND TYPE OF BIT ---			
2. LOCATION (Coordinates or Station) x= 656,942 ; y= 808,533				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel				12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-8				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 4	
						UNDISTURBED 0	
5. NAME OF DRILLER Leo Polanco				14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER 4632.6			
7. THICKNESS OF OVERBURDEN ---				16. DATE HOLE 26 Apr 84		STARTED 26 Apr 84	
8. DEPTH DRILLED INTO ROCK 0'				17. ELEVATION TOP OF HOLE 465.0		COMPLETED 26 Apr 84	
9. TOTAL DEPTH OF HOLE 13.5'				18. TOTAL CORE RECOVERY FOR BORING 0			
				19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4646	1'		gravelly Sand, 8" max.		#1		
	2'						
	3'		gravelly Sand, 3 1/2" max.				
	4'						
	5'				#2		
	6'						
	7'						
	8'		Silt		#3		
	9'		sandy Gravel, 4" max.				
	10'						
	11'				#4		
	12'						
	13'						
	14'						
	15'						

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(TRANSLUCENT)PROJECT
Cuchillo Negro CreekHOLE NO.
CN-T-8

DRILLING LOG			DIVISION	INSTALLATION	SHEET	
			SWD	Albuquerque District	OF 1 SHEETS	
1. PROJECT				10. SIZE AND TYPE OF BIT --		
Cuchillo Negro Creek				11. DATUM FOR ELEVATION SHOWN (MSL or MSL)		
2. LOCATION (Coordinates or Station)				MSL		
x= 656,788 ; y= 808,291				12. MANUFACTURER'S DESIGNATION OF DRILL		
3. DRILLING AGENCY				John Deere JD410 Backhoe		
Bartoo Sand and Gravel				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		
4. HOLE NO. (As shown on drawing title and file number)				DISTURBED 2 UNDISTURBED 0		
CN-T-9				14. TOTAL NUMBER CORE BOXES 0		
5. NAME OF DRILLER				15. ELEVATION GROUND WATER 4631.3		
Leo Polanco				16. DATE HOLE		
6. DIRECTION OF HOLE				STARTED 26 Apr 84 COMPLETED 26 Apr 84		
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED DEG. FROM VERT.				17. ELEVATION TOP OF HOLE 4640.0		
7. THICKNESS OF OVERBURDEN --				18. TOTAL CORE RECOVERY FOR BORING 0 %		
8. DEPTH DRILLED INTO ROCK 0'				19. SIGNATURE OF INSPECTOR		
9. TOTAL DEPTH OF HOLE 9.1'				<i>Stephen L. McPhee</i>		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
4640	1'		sandy Gravel, max. 12"		#1	
	2'					
	3'		sandy Gravel w/little clay		#2	
	4'					
	5'					
	6'					
	7'					
	8'					
	9'					wtr @ 8.7'
	10'					
	11'					
	12'					
	13'					
	14'					
	15'					

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PROJECT
Cuchillo Negro Creek

HOLE NO.
CN-T-9

DRILLING LOG		DIVISION SWD	INSTALLATION Albuquerque District		SHEET OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek			10. SIZE AND TYPE OF BIT --			
2. LOCATION (Coordinates or Station) x= 656,659 ; y= 808,000			11. DAYUM FOR ELEVATION SHOWN (728M or MSL)			
3. DRILLING AGENCY Bartoo Sand and Gravel			12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-10			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 3 UNDISTURBED 0	
5. NAME OF DRILLER Leo Polanco			14. TOTAL NUMBER CORE BOXES 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER 4629.2			
7. THICKNESS OF OVERBURDEN --			16. DATE HOLE STARTED 26 Apr 84 COMPLETED 26 Apr 84			
8. DEPTH DRILLED INTO ROCK 0'			17. ELEVATION TOP OF HOLE 4640.0			
9. TOTAL DEPTH OF HOLE 11'			18. TOTAL CORE RECOVERY FOR BORING 0 %			
			19. SIGNATURE OF INSPECTOR <i>Steven J. M...</i>			
ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4640			sandy Silt			
	1'		gravelly, sandy, Silt			
	2'				#1	
	3'		sandy Gravel			
	4'					
	5'					
	6'				#2	
	7'					
	8'					
	9'					
	10'		gravelly Sand, med.-course		#3	
	11'					wtr @ 10.8'
	12'					
	13'					
	14'					
	15'					

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PROJECT

Cuchillo Negro Creek

HOLE NO.

CN-T-10

DRILLING LOG		DIVISION	INSTALLATION		SHEET	
		SWD	Albuquerque District		OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek			10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinates or Station) x= 657,304 ; y= 808,360			11. DATUM FOR ELEVATION SHOWN (YSM or MSL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel			12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-11			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 2	UNDISTURBED 0
5. NAME OF DRILLER Leo Polanco			14. TOTAL NUMBER CORE BOXES 0		15. ELEVATION GROUND WATER 4631.0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			16. DATE HOLE 26 Apr 84		COMPLETED 26 Apr 84	
7. THICKNESS OF OVERBURDEN --			17. ELEVATION TOP OF HOLE 4640.0		18. TOTAL CORE RECOVERY FOR BORING 0	
8. DEPTH DRILLED INTO ROCK 0'			19. SIGNATURE OF INSPECTOR		2	
9. TOTAL DEPTH OF HOLE 9.5'						
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4640	1'		gravelly Silt, max. 6"		#1	
	2'					
	3'					
	4'					
	5'					
	6'		sandy Gravel, max. 8"		#2	
	7'					
	8'					
	9'					wtr @ 9'
	10'					
	11'					
	12'					
	13'					
	14'					
	15'					

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PROJECT
Cuchillo Negro Creek

HOLE NO.
CN-T-11

Hole No. CN-T-12

DRILLING LOG		DIVISION SWD		INSTALLATION Albuquerque District		SHEET OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek				10. SIZE AND TYPE OF BIT --			
2. LOCATION (Coordinates or Station) x= 657,230 ; y= 808,120				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL			
3. DRILLING AGENCY Bartoo San and Gravel				12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-12				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		14. TOTAL NUMBER CORE BOXES	
				DISTURBED 1		UNDISTURBED 0	
5. NAME OF DRILLER Leo Polanco				15. ELEVATION GROUND WATER 4629.2		16. DATE HOLE STARTED 26 Apr 84 COMPLETED 26 Apr 84	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				17. ELEVATION TOP OF HOLE 4635.0		18. TOTAL CORE RECOVERY FOR BORING 0 %	
7. THICKNESS OF OVERBURDEN --				19. SIGNATURE OF INSPECTOR <i>Stephen J. Mott</i>			
8. DEPTH DRILLED INTO ROCK 0'				9. TOTAL DEPTH OF HOLE 6.1'			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4635	1'		sandy Gravel, max. 12"		#1		
	2'						
	3'						
	4'						
	5'						
	6'					wtr @ 5.8'	
	7'						
	8'						
	9'						
	10'						
	11'						
	12'						
	13'						
	14'						
	15'						

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PROJECT
Cuchillo Negro Creek

HOLE NO.
CN-T-12

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
		SWD		Albuquerque District		OF 1 SHEETS	
1. PROJECT Cuchillo Negro Creek				10. SIZE AND TYPE OF BIT ---			
2. LOCATION (Coordinates or Station) x= 657,135 ; y= 807,854				11. DAYUM FOR ELEVATION SHOWN (TBM or BBL) MSL			
3. DRILLING AGENCY Bartoo Sand and Gravel				12. MANUFACTURER'S DESIGNATION OF DRILL John Deere JD410 Backhoe			
4. HOLE NO. (As shown on drawing title and file number) CN-T-13				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		UNDISTURBED	
5. NAME OF DRILLER Leo Polanco				14. TOTAL NUMBER CORE BOXES		0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER		4627.7	
7. THICKNESS OF OVERBURDEN --				16. DATE HOLE		STARTED 26 Apr 84 COMPLETED 26 Apr 84	
8. DEPTH DRILLED INTO ROCK 0'				17. ELEVATION TOP OF HOLE		4636.0	
9. TOTAL DEPTH OF HOLE 9.1'				18. TOTAL CORE RECOVERY FOR BORING		0 %	
				19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			
ELEVATION e	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4636	1'		sandy Gravel w/little silt max. 11"		#1		
	2'						
	3'						
	4'						
	5'						
	6'		sandy Gravel w/little clay		#2		
	7'						
	8'						
	9'					wtr @ 8.3'	
	10'						
	11'						
	12'						
	13'						
	14'						
	15'						

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MAR 71 (TRANSLUCENT)

PROJECT Cuchillo Negro Creek HOLE NO. CN-T-13

Hole No. CN-T-14

DRILLING LOG		DIVISION	INSTALLATION		SHEET	
1. PROJECT CUCHILLO NEGRO		SWD	SWA		1 OF 1 SHEETS	
2. LOCATION (Coordinates or Station) N. 80°12'10" E 657355			10. SIZE AND TYPE OF BIT NA			
3. DRILLING AGENCY Albg. Dist			11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD			
4. HOLE NO. (As shown on drawing title and file number) CN-T-14			12. MANUFACTURER'S DESIGNATION OF DRILL FORD BACKHOE			
5. NAME OF DRILLER BARTOO SAND			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 2		DISTURBED UNDISTURBED	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			14. TOTAL NUMBER CORE BOXES —		15. ELEVATION GROUND WATER NOT ENCOUNTERED	
7. THICKNESS OF OVERBURDEN UNKNOWN			16. DATE HOLE MARCH 87		STARTED COMPLETED MARCH 87	
8. DEPTH DRILLED INTO ROCK —			17. ELEVATION TOP OF HOLE 4755			
9. TOTAL DEPTH OF HOLE 6'			18. TOTAL CORE RECOVERY FOR BORING —		19. SIGNATURE OF INSPECTOR James H. McAllister	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
4755	0'		GRAVEL, Sandy, silty - COBBLES TO 5", few COBBLES BELOW 4'			BETTER CLASSIFICATION BASED ON LAB TESTS.
	1'				1	(SP-3M)
	2'					
	3'					
	4'					
	5'				2	(SP-3M)
4749	6'		BOTTOM OF HOLE			

Hole No. CN-T-15

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS		
1. PROJECT CUCHILLO NEGRO		SWD	SWA			
2. LOCATION (Coordinates or Station) N. 807130; E 657100			10. SIZE AND TYPE OF BIT N/A	11. DAY ON FOR ELEVATION SHOWN (YEM - MSL) NLVD		
3. DRILLING AGENCY ALBR. DIST.			12. MANUFACTURER'S DESIGNATION OF DRILL FORD BACKHOE	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED: 1 UNDISTURBED: 0		
4. HOLE NO. (As shown on drawing title and file number) CN-T-15			14. TOTAL NUMBER CORE BOXES —	15. ELEVATION GROUND WATER NOT ENCOUNTERED		
5. NAME OF DRILLER BARTOO SAND			16. DATE HOLE STARTED: MARCH 87 COMPLETED: MARCH 87	17. ELEVATION TOP OF HOLE 4735		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			18. TOTAL CORE RECOVERY FOR BORING —	19. SIGNATURE OF INSPECTOR <i>James M. McArthur</i>		
7. THICKNESS OF OVERBURDEN UNKNOWN						
8. DEPTH DRILLED INTO ROCK —						
9. TOTAL DEPTH OF HOLE 4'						
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
4735	0		CLAY, sandy, silty, some gravel to 3/8", red.		1 (CL)	LETTER CLASSIFICATION BASED ON LAB TESTS. This material below Palomas Gravel.
	1					
	2					
	3					
4731	4		BOTTOM OF HOLE			

ENG FORM 1836
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B-13

PROJECT
CUCHILLO NEGROHOLE NO.
CN-T-15

Hole No. CN-T-16

DRILLING LOG		DIVISION SWD	INSTALLATION SWA	SHEET 1 OF 1 SHEETS
1. PROJECT CUCHILLO NEGRO			10. SIZE AND TYPE OF BIT —	
2. LOCATION (Coordinate or Station) N 807140 E 657180			11. DATUM FOR ELEVATION SHOWN (TBM or BSL) NGVD	
3. DRILLING AGENCY ALBO DIST			12. MANUFACTURER'S DESIGNATION OF DRILL FORD BACKHOE	
4. HOLE NO. (As shown on drawing title and file number) CN-T-16			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN 2	
5. NAME OF DRILLER BARTOO SAND & GRAVEL			14. TOTAL NUMBER CORE BOXES —	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER —	
7. THICKNESS OF OVERBURDEN UNKNOWN			16. DATE HOLE STARTED MARCH 87 COMPLETED MARCH 87	
8. DEPTH DRILLED INTO ROCK —			17. ELEVATION TOP OF HOLE 4744	
9. TOTAL DEPTH OF HOLE 5'			18. TOTAL CORE RECOVERY FOR BORING —	
			19. SIGNATURE OF INSPECTOR <i>James H. McAfee</i>	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
4744	0		Sand, gravelly, clayey, 3" Max size			LETTER CLASSIFICATION BASED ON LAB TEST.
	1					
	2				1	(SP-SC)
	3					
	4		Sand, silty, clayey, dark red			
4739	5		BOTTOM OF HOLE		2	(SC-3M)

Hole No. CN-T-17

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 1 SHEETS	
1. PROJECT CUCHILLO NEGRO				10. SIZE AND TYPE OF BIT ---			
2. LOCATION (Coordinates or Station) N. 806990. E. 456955				11. DATUM FOR ELEVATION SHOWN (TBM or BNC) NGVD			
3. DRILLING AGENCY ALCO DIST.				12. MANUFACTURER'S DESIGNATION OF DRILL FORD BACKHOE			
4. HOLE NO. (As shown on drawing title and file number) CN-T-17				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 1		DISTURBED UNDISTURBED	
5. NAME OF DRILLER BARTOO SAND				14. TOTAL NUMBER CORE BOXES ---			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. DATE HOLE MARCH 87		STARTED COMPLETED MARCH 87	
7. THICKNESS OF OVERBURDEN ---				17. ELEVATION TOP OF HOLE 4730			
8. DEPTH DRILLED INTO ROCK ---				18. TOTAL CORE RECOVERY FOR BORING ---			
9. TOTAL DEPTH OF HOLE 3				19. SIGNATURE OF INSPECTOR Samuel McAllister			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4730	0		SAUD, silty, clayey, red			LETTER CLASSIFICATION BASED ON LAB TESTS.	
	1				1	(SM)	
4727	3		BOTTOM OF HOLE				

Hole No. CN-T-18

DRILLING LOG		DIVISION SWD		INSTALLATION SWA		SHEET 1 OF 1 SHEETS	
1. PROJECT CUCHILLO NEGRO				10. SIZE AND TYPE OF BIT —			
2. LOCATION (Coordinates or Station) N 897120; E 457210				11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD			
3. DRILLING AGENCY ALBA DIST				12. MANUFACTURER'S DESIGNATION OF DRILL FORD BACKHOLE			
4. HOLE NO. (As shown on drawing title and file number) CN-T-18				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 1	
5. NAME OF DRILLER BARTOO SAND				14. TOTAL NUMBER CORE BOXES —		UNDISTURBED —	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED — DEG. FROM VERT.				15. ELEVATION GROUND WATER —		16. DATE HOLE STARTED MARCH 87	
7. THICKNESS OF OVERBURDEN —				17. ELEVATION TOP OF HOLE 4740		COMPLETED MARCH 87	
8. DEPTH DRILLED INTO ROCK —				18. TOTAL CORE RECOVERY FOR BORING —		3	
9. TOTAL DEPTH OF HOLE 3'				19. SIGNATURE OF INSPECTOR <i>James M. Hall</i>			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling: time, water loss, depth of weathering, etc., if significant)	
4740	0'		CLAY, sandy, some gravel red.			LETTER CLASSIFICATION BASED ON LAB TESTS.	
	1				1	(SC)	
4737	3		BOTTOM OF HOLE				

PRE-CONSTRUCTION 8-INCH AUGER BORINGS

DRILLING LOG			DIVISION		INSTALLATION		SHEET	
PROJECT			S.W.D.		ALB. DIST.		OF 1 SHEETS	
LOCATION			RIO GRANDE FLOODWAY		8" HOLLOW STEM AUGER			
T or C UNIT, N.M.					N.G.V.D.			
N 807.110 ; E 657.055			ALB. DISTRICT		C.M.E. 55			
HOLE NO. (As shown on drawing 816 and its number)			CN-8A-1		TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		8 0	
NAME OF DRILLER			S.W. ENGINEERING		TOTAL NUMBER CORES BORER			
DIRECTION OF FILL					ELEVATION GROUND WATER		N/A	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> SLOPED _____ DEGS. FROM VERT.					DATE HOLE		STARTED 17 Mar 88 COMPLETED 17 Mar 88	
THICKNESS OF OVERBURDEN					ELEVATION TOP OF HOLE		4748	
DEPTH DRILLED INTO ROCK			NA		TOTAL CORE RECOVERY FOR BORER			
TOTAL DEPTH OF HOLE			35'		SIGNATURE OF INSPECTOR		Stephen D. Mott	
ELEVATION	DEPTH	LOGGING	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)		
	2		Sand, very silty, light brown, fine grained			1100-1330		
	4				#1			
	6							
	8				#2			
	10		Sand, little clayey, brown					
	12				#3			
	14		Sand, gravelly, silty, brown max. 1 1/4'		#4			
	16							
	18		Silt, brown		#5			
	20		Sand, silty, brown		#6			
	22		Gravel, sandy, max. 3 1/2'		#7	Motion of rig from 20'-26' indicates cobbles and boulders to 1 1/2'		
	24							
	26		Sand, gravelly, max. 2 1/2'		#8			
	28							
	30							
	32							
	34							
	36		Bottom of Hole					
	38							

END FORM 1836
MAR 71

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PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.
CN-8A-1

DRILLING LOG		DWGSN S.W.D.		INSTALLATION ALB. DIST.		SHEET 1	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				13. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Geographic or Station) N 807.130 ; E 657.210				14. DAY OF YEAR FOR ELEVATION (1st or 2nd) N.G.V.D.			
3. DRILLING AGENCY ALB. DISTRICT				15. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drawing 886 and file number) CN-8A-2				16. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		17. CAPTURED	18. UNCAPTURED
5. NAME OF DRILLER S.W. ENGINEERING				19. TOTAL NUMBER CORE BOXES		20. ELEVATION GROUND WATER NA	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				21. DATE HOLE STARTED 17 Mar 88		22. COMPLETED 17 Mar 88	
7. THICKNESS OF OVERBURDEN				23. ELEVATION TOP OF HOLE 4746		24. TOTAL CORE RECOVERY FOR BORING %	
8. DEPTH DRILLED INTO ROCK NA				25. SIGNATURE OF INSPECTOR <i>Stephen D. Moody</i>			
TOTAL DEPTH OF HOLE 34'							

ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	1. CORE RECOVERY e	2. CORE SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		Sand, silty, some pea-gravel, light brown			1445-1600
	4		Sand, very silty, some gravel to 1 1/4' light brown		#1	
	6					
	8					
	10		Silt, sandy, trace pea-gravel, light brown		#2	
	12					
	14					
	16		layer of gravelly silt		#3	
	18					
	20		Gravel, silty, sandy max. 2 1/8", light brown		#4	
	22		Silt, sandy, brown		#5	
	24					
	26		Gravel, silty, sandy, max. 3", light brown		#6	
	28		Silt, sandy, brown		#7	
	30					
	32		Gravel, silty, brown, max. 3 1/4'		#8	
	34		Bottom of Hole		#9	
	36					
	38					

SDG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-2

DRILLING LOG		DIRECTION		INSTALLATION		SHEET	
PROJECT		S.W.D.		ALB. DIST.		OF 1 SHEETS	
1. PROJECT		RID GRANDE FLOODWAY		2. SIZE AND TYPE OF BIT		8" HOLLOW STEM AUGER	
T or C UNIT, N.M.				3. DAYLOG FOR ELEVATION SHOWN (HET or LEL)			
4. LOCATION (Coordinates or Station)		N. 807.120; E. 657.325		N.G.V.D.			
5. DRILLING AGENCY		ALB. DISTRICT		6. MANUFACTURER'S DESIGNATION OF DRILL		C.M.E. 55	
7. HOLE NO. (As shown on drawing D6a and file number)		CN-8A-3		8. TOTAL NO. OF CORES		COMPLETED	
				BURDEN SAMPLES TAKEN		6 0	
9. NAME OF DRILLER		S.W. ENGINEERING		10. TOTAL NUMBER CORES BORNE			
11. DIRECTION OF DRILL				12. ELEVATION GROUND WATER		N/A	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				13. DATE HOLE		STARTED 17 MAR 88 COMPLETED 17 MAR 88	
14. THICKNESS OF OVERBURDEN		N/A		15. ELEVATION TOP OF HOLE		4739	
16. DEPTH DRILLED INTO ROCK		N/A		17. TOTAL CORE RECOVERY FOR BORING		2	
TOTAL DEPTH OF HOLE		39'		18. SIGNATURE OF INSPECTOR		<i>Stacy D. Nix</i>	
ELEVATION a	DEPTH b	LOGGING c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	2		Sand, silty, gravelly, max. 1 1/4", light brown			1615-1730	
	4				#1		
	6		Sand, silty, light brown				
	8				#2		
	10						
	12		Silt, sandy, light brown				
	14				#3		
	16						
	18		Gravel, sandy, silty, light brown, max. 2 1/2"		#4		
	20						
	22						
	24						
	26						
	28				#5		
	30						
	32		Silt, sandy, brown				
	34				#6		
	36						
	38						
			Bottom of Hole				

END FORM 1836
(MAY 71)PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RID GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-3

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1 SHEETS	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				2. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER N.G.V.D.			
3. LOCATION (Coordinates or Station) N 807,050; E 657,320				3. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. DRILLING AGENCY ALB. DISTRICT				5. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		6. DISTURBED 4	
4. HOLE NO. (As shown on drilling log and its number) CN-8A-4				7. TOTAL NUMBER CORES BORNE		8. UNDISTURBED 0	
5. NAME OF DRILLER S.W. ENGINEERING				9. ELEVATION GROUND WATER N/A			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ OBS. FROM VERT.				10. DATE HOLE		11. STARTED 17 MAR 88	
7. THICKNESS OF OVERBURDEN N/A				12. ELEVATION TOP OF HOLE 4732		13. COMPLETED 17 MAR 88	
8. DEPTH DRILLED INTO ROCK 29'				14. TOTAL CORE RECOVERY FOR BORING		15. SIGNATURE OF INSPECTOR Stephen D. Mont	
TOTAL DEPTH OF HOLE							
ELEVATION •	DEPTH •	LEGEND •	CLASSIFICATION OF MATERIALS (Description) •	1. CORE RECOVERY •	2. CORE SAMPLE NO. •	REMARKS (Drilling time, water loss, depth of marking, etc., if significant)	
	2		Sand, silty, gravelly, brown, max. 2'			1740-1830	
	4		lost material, a 6" rock had obstructed the hollow stem		#1		
	6						
	8						
	10		Silt, sandy, little gravel, max. 1'				
	12				#2		
	14						
	16						
	18		Silt, sandy, brown		#3		
	20						
	22						
	24						
	26						
	28				#4		
	30		Bottom of Hole				

BHQ FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-4

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				10. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Coordinates or Station) N 867.130 E 657.545				11. BATHY FOR ELEVATION (Feet or Meters) N.G.V.D.			
3. DRILLING METHOD ALB. DISTRICT				12. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drawing 886 and the number) CN-8A-5				13. TOTAL NO. OF CORES DISPERSED 7		UNDISPERSED 0	
5. NAME OF DRILLER S.W. ENGINEERING				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER N/A			
7. THICKNESS OF OVERBURDEN				16. DATE HOLE STARTED 18 MAR 88		COMPLETED 18 MAR 88	
8. DEPTH DRILLED INTO ROCK N/A				17. ELEVATION TOP OF HOLE 4724			
TOTAL DEPTH OF HOLE 24'				18. TOTAL CORE RECOVERY FOR BORING			
19. SIGNATURE OF SUPERVISOR Stephen D. Woolf				20. REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)			
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	2. CORE RECOVERY e	BOX OR SAMPLE NO. f		
	2		Sand, silty, little gravel, max. 1'		#1		
	4		Sand, silty, gravelly max. 1 1/2'		#2		
	6		Silt, sandy, brown		#3		
	8		Sand, silty, gravelly, max. 1'		#4		
	10		Gravel, sandy, max. 2 1/2'		#5		
	12						
	14		Sand, silty, brown		#6		
	16						
	18		Gravel, sandy, max. 3 1/2'		#7		
	20						
	22						
	24		Bottom of Hole				
	26						

BIO FORM 1036
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M.HOLE NO.
CN-8A-5

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				2. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
3. LOCATION (Coordinates or Station) N 806.530 ; E 657.350				4. DATUM FOR ELEVATION MEASUREMENT (TBM or B.S.) N.G.V.D.			
5. DRILLING METHOD ALB. DISTRICT				6. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
7. HOLE NO. (As shown on drawing B-6 and B-6 number) CN-8A-6				8. TOTAL NO. OF CORES		9. CORES	
				OBTAINED		UNOBTAINED	
				3		0	
10. NAME OF DRILLER S.W. ENGINEERING				11. TOTAL NUMBER CORES BORNE			
12. DIRECTION OF HOLE				13. ELEVATION GROUND WATER			
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEGR. FROM VERT.				14. DATE HOLE			
				STARTED		COMPLETED	
				18 Mar 88		18 Mar 88	
15. THICKNESS OF OVERBURDEN				16. ELEVATION TOP OF HOLE 46.77			
17. DEPTH DRILLED INTO ROCK N/A				18. TOTAL CORE RECOVERY FOR BORING 3			
TOTAL DEPTH OF HOLE 14'				19. SIGNATURE OF INSPECTOR <i>Stephen D. Morley</i>			

ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	5 CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1		Gravel, sandy, moist max. 5'		#1	0815-0845
	2					
	3					
	4					
	5		Sand, gravelly, little clayey, moist, reddish brown		#2	
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14		Bottom of Hole		#3	
	15					
	16					
	17					
	18					
	19					

BNQ FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-6

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1 SHEETS	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				12. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
3. LOCATION (Coordinates or Station) N 806,770 ; E 657,565				13. DATUM FOR ELEVATION (N.G.V.D. or 2nd)			
5. DRILLING AGENCY ALB. DISTRICT				14. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drawing title and file number) CN-8A-7				15. TOTAL NO. OF CORES		16. TOTAL NO. OF CORES	
6. NAME OF DRILLER S.W. ENGINEERING				17. ELEVATION GROUND WATER /		18. DATE HOLE	
8. DEPTH OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ COR. FROM VERT.				19. DATE HOLE 18 Mar 88		20. DATE HOLE 18 Mar 88	
7. THICKNESS OF OVERBURDEN				21. ELEVATION TOP OF HOLE 4671		22. TOTAL CORE RECOVERY FOR BORING	
9. DEPTH DRILLED INTO ROCK N/A				23. SIGNATURE OF SUPERVISOR		24. SIGNATURE OF SUPERVISOR	
TOTAL DEPTH OF HOLE 8'				25. SIGNATURE OF SUPERVISOR			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	2. CORE RECOVERY e	3. CORE SAMPLE NO. f	REMARKS (Drilling time, water level, depth of weathering, etc. if significant) g	
	1		Sand, gravelly, brown max. 2 1/2"			0850-0910	
	2						
	3						
	4		Sand, silty, red. gray				
	5		Gravel, trace sand, max. 4"				
	6						
	7						
	8		Auger Refusal				
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						

ENG FORM 1836

MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.

(TRANSLUCENT)

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.

CN-8A-7

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				13. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
1. LOCATION (Coordinates or Station) N 806.665; E 658.325				14. STATUS FOR ELEVATION CORRECTION (YES or NO) N.G.V.D.			
2. DRILLING METHOD ALB. DISTRICT				15. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
3. HOLE NO. (As shown on drawing 055 and its number) CN-8A-8				16. TOTAL NO. OF OVER-SPURD SAMPLES TAKEN		17. DEPTH OF CORE	
4. NAME OF DRILLER S.W. ENGINEERING				18. TOTAL NUMBER OVER CORRE		19. ELEVATION GROUND WATER	
5. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				20. DATE HOLE		21. ELEVATION TOP OF HOLE 4656	
7. THICKNESS OF OVERBURDEN				22. DATE HOLE 18 Mar 88		23. ELEVATION TOP OF HOLE 18 Mar 88	
8. DEPTH DRILLED INTO ROCK N/A				24. ELEVATION TOP OF HOLE		25. TOTAL CORE RECOVERY PER SERIES	
TOTAL DEPTH OF HOLE 8'				26. SIGNATURE OF OPERATOR <i>Stephen D. Montz</i>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	1. CORE RECOVERY e	2. CORE SAMPLE NO. f	REMARKS (Drilling time, water, length of working, etc., if different) g	
	1		Gravel, sandy			0925-0950	
	2		Sand, clayey, reddish brown		#1		
	3		Sand, little clayey, reddish brown, little gravel, max. 1 1/2"		#2		
	4						
	5		Auger Refusal				
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						

END FORM 1336
MAY 71

PREVIOUS EDITIONS ARE OBSOLETE
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-8

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
PROJECT		S.W.D.		ALB. DIST.		1	
RIO GRANDE FLOODWAY				8" HOLLOW STEM AUGER			
T or C UNIT, N.M.				N.G.V.D.			
LOCATION (Coordinates or Station)				MANUFACTURER'S DESIGNATION OF DRILL			
N 808.470 ; E 657.600				C.M.E. 55			
ALB. DISTRICT				TOTAL NO. OF CORES			
HOLE NO. (As shown on drilling log and its number)		CN-8A-9		EXPANDED		UNEXPANDED	
				1		0	
NAME OF DRILLER		S.W. ENGINEERING		TOTAL NUMBER CORE BOXES			
				ELEVATION GROUND WATER			
DIRECTION OF FILL				DATE MOLE		STARTED	
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		SINK FROM VENT.		18 Mar 88		18 Mar 88	
THICKNESS OF OVERBURDEN				ELEVATION TOP OF MOLE		4628	
DEPTH DRILLED INTO ROCK		N/A		TOTAL CORE RECOVERY FOR BORING			
TOTAL DEPTH OF MOLE		8'		SIGNATURE OF SUPERVISOR		Stephen D. Mott	

ELEVATION	DEPTH	LOGGED	CLASSIFICATION OF MATERIALS (Description)	NO. CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water level, depth of weathering, etc., if significant)
	1		Gravel, sandy, brown Cobbles on surface		#1	1010-1035
	2					
	3					
	4					
	5					
	6					
	7					
	8			Auger Refusal		
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

END FORM 1836
MAY 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRAVEL/UDVT)

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-9

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				12. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Coordinates or Station) N 807.600 : E 658.305				13. DATE AND TIME OF DRILLING N.G.V.D.			
3. DRILLING AGENCY ALB. DISTRICT				14. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drawing Bldg and Site number) CN-8A-10				15. TOTAL NO. OF CORES SUNDEN SAMPLES TAKEN		16. TOTAL NUMBER CORES BORING	
5. NAME OF DRILLER S.W. ENGINEERING				17. ELEVATION GROUND WATER		18. ELEVATION TOP OF HOLE 4618	
6. DEPTH OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEB. FROM VENT.				19. DATE HOLE 18 Mar 88		20. DATE HOLE 18 Mar 88	
7. THICKNESS OF OVERBURDEN				21. ELEVATION TOP OF HOLE 4618			
8. DEPTH DRILLED INTO ROCK N/A				22. TOTAL CORE RECOVERY FOR BORING			
TOTAL DEPTH OF HOLE 14'				23. SIGNATURE OF INSPECTOR <i>Stephen D. Mott</i>			

ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	1. CORE RECOVERY e	2. CORE SAMPLE NO. f	REMARKS (Drilling time, water level, depth of weathering, etc., if significant) g
	1		Sand and Gravel, brown		#1	1045-1100
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15		Bottom of Hole			
	16					
	17					
	18					
	19					

END FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLATED)

PROJECT **RIO GRANDE FLOODWAY
T or C UNIT, N.M.** HOLE NO. **CN-8A-10**

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				13. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
1. LOCATION (Coordinates or Station) N 807.179 ; E 658.450				14. DATE FOR ELEVATION BOREHOLE (1105-1132) N.G.V.D.			
2. DRILLING AGENCY ALB. DISTRICT				15. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
3. HOLE NO. (As shown on drilling log and its number) CN-8A-11				16. TOTAL NO. OF CORES		17. TOTAL NO. OF CORES	
				DISPERSED		UNDISPERSED	
				1		0	
4. NAME OF DRILLER S.W. ENGINEERING				18. ELEVATION OF GROUND WATER			
5. DIRECTION OF FILL <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> HORIZONTAL _____ OBS. FROM VERT.				19. DATE HOLE 18 Mar 88			
				20. DATE HOLE 18 Mar 88			
7. THICKNESS OF OVERBURDEN				21. ELEVATION TOP OF HOLE 4613			
8. DEPTH DRILLED INTO ROCK N/A				22. TOTAL CORE RECOVERY FOR BOREHOLE			
TOTAL DEPTH OF HOLE 14'				23. SIGNATURE OF INSPECTOR <i>Stephen D. Moore</i>			

ELEVATION a	DEPTH b	LITHOLOGY c	CLASSIFICATION OF MATERIALS (Description) d	NO. OF CORE RECOVERY e	BOX OR SAMPLER NO. f	REMARKS (Drilling time, water level, depth of weathering, etc., if significant) g
	1		Sand and Gravel, brown			1105-1132
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15		Bottom of Hole			
	16					
	17					
	18					
	19					

ENG FORM 1836
MAY 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

WELL NO.

CN-8A-11

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				10. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
11. LOCATION (Coordinates or Station) N 806.695; E 659.660				12. STATUS FOR ELEVATION BENCH (YES or NO) N.G.V.D.			
13. DISTRICT ALB. DISTRICT				14. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
15. HOLE NO. (As shown on drawing title and its number) CN-8A-12				16. TOTAL NO. OF CORES SUNDEN SAMPLES TAKEN		17. DISTURBED 2	
18. NAME OF DRILLER S.W. ENGINEERING				19. TOTAL NUMBER CORES SOWN		20. UNDISTURBED 0	
21. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ OBS. FROM VERT.				22. ELEVATION GROUND WATER			
23. THEODOLITE OF OVERSIGHT				24. DATE HOLE STARTED 18 Mar 88		25. COMPLETED 18 Mar 88	
26. DEPTH DRILLED INTO ROCK N/A				27. ELEVATION TOP OF HOLE 4596		28. TOTAL CORE RECOVERY FOR BORING	
29. TOTAL DEPTH OF HOLE 14'				30. SIGNATURE OF INSPECTOR <i>Stephen D. Monty</i>			

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SOIL OR SAMPLE NO. f	REMARKS (Drilling time, water level, depth of g)
	1		Sand and Gravel, brown			1150-1210
	2				#1	
	3					
	4					
	5					
	6					
	7				#2	
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15		Bottom of Hole			
	16					
	17					
	18					
	19					

ENG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M. HOLE NO. CN-8A-12

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1 SHEETS	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				10. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Coordinates or Station) N 806.690 E 659.300				11. DATUM FOR ELEVATION SURFACE OF B.O. N.G.V.D.			
3. DRILLING AGENCY ALB. DISTRICT				12. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (as shown on drawing 886 and its number) CN-8A-13				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		14. TOTAL NUMBER CORE BOXES	
5. NAME OF DRILLER S.W. ENGINEERING				15. ELEVATION GROUND WATER		16. DATE HOLE STARTED 18 Mar 88 COMPLETED 18 Mar 88	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEEP FROM VERT.				17. ELEVATION TOP OF HOLE 4601		18. TOTAL CORE RECOVERY FOR BORING %	
7. THICKNESS OF OVERBURDEN				19. SIGNATURE OF INSPECTOR <i>Stephen D. Martz</i>		20. REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
8. DEPTH DRILLED INTO ROCK N/A				21. TOTAL DEPTH OF HOLE 14'			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	1		Gravel, sandy, brown			1210-1230	
	2				#1		
	3						
	4						
	5						
	6						
	7						
	8		Sand and Gravel, brown, max. 4'		#2		
	9						
	10						
	11						
	12						
	13						
	14		Bottom of Hole				
	15						
	16						
	17						
	18						
	19						

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO. LN-8A-6

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1 SHEETS	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				10. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Coordinates or Section) N 808.890 : E 657.200				11. DATUM FOR ELEVATION (NGVD or MSL) N.G.V.D.			
3. DRILLING AGENCY ALB. DISTRICT				12. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drilling site and file number) CN-8A-14				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		14. TOTAL NUMBER CORE BOXES	
5. NAME OF DRILLER S.W. ENGINEERING				15. ELEVATION GROUND WATER		16. DATE HOLE	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DATA FROM VERT.				17. ELEVATION TOP OF HOLE 4633		18. TOTAL CORE RECOVERY FOR BORING	
7. THICKNESS OF OVERBURDEN				19. SIGNATURE OF INSPECTOR <i>Stephen D. Mott</i>		19. SIGNATURE OF INSPECTOR	
8. DEPTH DRILLED INTO ROCK N/A				19. SIGNATURE OF INSPECTOR		19. SIGNATURE OF INSPECTOR	
TOTAL DEPTH OF HOLE 14'				19. SIGNATURE OF INSPECTOR		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1		Sand and Gravel, brown			1245-1255
	2				#1	
	3					
	4					
	5					
	6					
	7					
	8		Gravel, sandy, brown		#2	
	9					
	10					
	11					
	12					
	13					
	14		Bottom of Hole			
	15					
	16					
	17					
	18					
	19					

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-8A-14

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 1 SHEETS	
1. PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				10. SIZE AND TYPE OF BIT 8" HOLLOW STEM AUGER			
2. LOCATION (Coordinates or Station) N 808.145; E 656.860				11. DATUM FOR ELEVATION SURFACE OF REF. N.G.V.D.			
3. DRILLING AGENCY ALB. DISTRICT				12. MANUFACTURER'S DESIGNATION OF DRILL C.M.E. 55			
4. HOLE NO. (As shown on drawing title and file number) CN-8A-15				13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		14. TOTAL NUMBER CORE BOXES	
5. NAME OF DRILLER S.W. ENGINEERING				15. ELEVATION GROUND WATER		16. DATE HOLE	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				17. ELEVATION TOP OF HOLE 4639		18. TOTAL CORE RECOVERY FOR BORING 2	
7. THICKNESS OF OVERBURDEN				19. SIGNATURE OF INSPECTOR		20. REMARKS	
8. DEPTH DRILLED INTO ROCK N/A				21. SIGNATURE OF INSPECTOR		22. REMARKS	
TOTAL DEPTH OF HOLE 14'				23. SIGNATURE OF INSPECTOR		24. REMARKS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	1		Gravel, sandy, moist, brown			1257-1308 wtr. @ 8'	
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15		Bottom of Hole				
	16						
	17						
	18						
	19						

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M. HOLE NO. CN-8A-15

DRILLING LOG			DIVISION		INSTALLATION		SHEET	
1. PROJECT			S.W.D.		ALB. DIST.		1	
2. LOCATION (Coordinates or Station)			RIO GRANDE FLOODWAY		8" HOLLOW STEM AUGER		OF 1 SHEETS	
3. DRILLING AGENCY			T or C UNIT, N.M.		N.G.V.D.			
4. HOLE NO. (As shown on drawing 885 and 886 number)			CN-8A-16		C.M.E. 55			
5. NAME OF DRILLER			S.W. ENGINEERING		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		2	
6. DIRECTION OF HOLE			14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER			
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			16. DATE HOLE		17. ELEVATION TOP OF HOLE		4643	
7. THICKNESS OF OVERBURDEN			18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR			
8. DEPTH DRILLED INTO ROCK			N/A		18 Mar 88		18 Mar 88	
TOTAL DEPTH OF HOLE			14'		Stephen D. Morley			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)		
	1		Gravel, sandy, brown max. 4'			1312-1325 wtr. @ 8'		
	2				#1			
	3							
	4							
	5							
	6							
	7		same as above, but more sand		#2			
	8							
	9							
	10							
	11							
	12							
	13							
	14		Bottom of Hole					
	15							
	16							
	17							
	18							
	19							

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M.HOLE NO.
CN-8A-16

PRE-CONSTRUCTION 4-INCH ROTARY BORINGS

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT Cuchillo Negro Tenn		SWD		ALBQ DIST		OF 1 SHEETS	
2. LOCATION (Coordinates or Station) N 80° 22' 20" E 657405				10. SIZE AND TYPE OF BIT 1 1/2" core bit			
3. DRILLING AGENCY Albuquerque District, Corps of Engineers				11. DATUM FOR ELEVATION SHOWN (FSM or MSL) Mean Seabed			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-13				12. MANUFACTURER'S DESIGNATION OF DRILL Mobile Drill B-1			
5. NAME OF DRILLER P.R. Drilling				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 1		UNDISTURBED 0	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input checked="" type="checkbox"/> INCLINED _____ DEG. FROM VERT.				14. TOTAL NUMBER CORE BOXES 0			
7. THICKNESS OF OVERBURDEN 4' ±				15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK 2'				16. DATE HOLE STARTED 12/11/86 COMPLETED 12/11/86			
9. TOTAL DEPTH OF HOLE 6'				17. ELEVATION TOP OF HOLE 4747'			
				18. TOTAL CORE RECOVERY FOR BORING Not Appl			
				19. SIGNATURE OF INSPECTOR John A. Davis / WTI			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4741	2.0	●	Gravelly sand with clay trace cobbles, trace boulders, light brown, low to medium plasticity, moist	Not Appl.	CN-CH-13 0'-2'	Enter: drilling 12/11/86 0'-2': 100% H ₂ O recovery (drilling mud used) slow drilling (2"-3"/min)	
4737	10	●	Same as above, but lacking as much gravel, rubble & boulders.		No sample 2'-50'		
4727	0	●	Rare gravelly or cobbly intervals.				
4717	30	●	Material appears to be Tertiary sediments as identified from great variety of lithologies represented in small sized cuttings				
4702	40	●					
4697	50	●	Limestone bedrock boulders, or cemented Tertiary sediments			48'-50': 100% H ₂ O recovery (drilling mud used) slow drilling (3"/min) stopped drilling on 12/11/86	
			Stopped drilling @ 50.0'				

Hole No. CN-CH-14

DRILLING LOG		DIVISION SWD	INSTALLATION ALBQ DIST	SHEET 1 OF 1 SHEETS
1. PROJECT Cochillo Negro Dam		10. SIZE AND TYPE OF BIT 1 1/2" diameter		
2. LOCATION (Coordinates or Station) N. 807060 E. 657045		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) Mean Sea Level		
3. DRILLING AGENCY Albuquerque District Corp of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-61		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-14		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 1 UNDISTURBED 0		
5. NAME OF DRILLER P.R. Drilling		14. TOTAL NUMBER CORE BOXES 0		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 0'		16. DATE HOLE STARTED 12/12/86 COMPLETED 12/12/86		
8. DEPTH DRILLED INTO ROCK 0'		17. ELEVATION TOP OF HOLE 4744'		
9. TOTAL DEPTH OF HOLE 0'		18. TOTAL CORE RECOVERY FOR BORING Not Appl. 3		
		19. SIGNATURE OF INSPECTOR John L. Davis		

ELEVATION •	DEPTH •	LEGEND •	CLASSIFICATION OF MATERIALS (Description) •	% CORE RECOVERY •	BOX OR SAMPLE NO. •	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) •
	0		Gravelly sand with clay, trace cobbles, trace boulders, light brown, light to medium plasticity, moist	Not Appl.	CN-CH-14 0'-5'	Started Drilling 12/12/86 0'-5.0': 100% H ₂ O recovery (drilling mud used) Slow drilling (2"-3"/min)
	10		Coarse sand with gravel, trace cobbles, trace boulders, occasional gravelly intervals (5' thick)			5.0'-50.0': 100% H ₂ O recovery (drilling mud used) Fast drilling (1"-2"/min)
	20		material appears to be Tertiary sediments as identified from great variety of lithologies represented in sand sized cuttings			
	30					
	40					
	50		Stopped drilling @ 50.0'			Stopped drilling on 12/12/86

PRE-CONSTRUCTION 6-INCH DENISON BORING

Hole No. *1457*

DRILLING LOG		DIVISION	INSTALLATION	SHEET OF SHEETS		
1. PROJECT			10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY			12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and file number)			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN			
5. NAME OF DRILLER			14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN			16. DATE HOLE			
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE			18. TOTAL CORE RECOVERY FOR BORING			
			19. SIGNATURE OF INSPECTOR			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE N.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
45.6	0		Overburden (Mudstone)			Each drilled to 9'
	1		Hard, light gray, shales			at bottom to mud
	2					at 10' to 11' to 12'
	3					11.5' to 12.2'
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
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	82					
	83					
	84					
	85					
	86					
	87					
	88					
	89					
	90					
	91					
	92					
	93					
	94					
	95					
	96					
	97					
	98					
	99					
	100					

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <i>5N-D-1</i>	
PROJECT			INSTALLATION		SHEET <i>2</i> OF SHEETS	
ELEVATION #	DEPTH #	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20				<i>Sample #3</i>	
	21		<i>limestone, hd-de. om.</i>		<i>cont</i>	
	22					
	23					
	24					
	25				<i>25.6</i>	
	26		<i>shale, interbedded w/ limestone</i>		<i>Sample #4</i>	
	27				<i>27.5</i>	
	28		<i>limestone w/ clay ls; ss. off to m. ss. zone 200 ft to 100 ft. calc. to ss. zone</i>		<i>28.4</i>	
	29				<i>29.4</i>	
	30				<i>#1</i>	
	31				<i>31.4</i>	
	32					
	33					
	34		<i>shale, ss. zone, to 100 ft. ss.</i>		<i>34.5</i>	
	35				<i>35.2</i>	
	36				<i>36.1</i>	
	37					
	38		<i>limestone, ss. zone - 100 ft. to 200 ft.</i>		<i>38.2</i>	
	39					
	40					
	41					
	42					
	43					
	44					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. <i>CN-D-1</i>		
PROJECT		INSTALLATION		SHEET <i>5</i> OF <i>5</i> SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	44		<i>limestone cont.</i>			
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54		<i>fine, red, and gray</i>		<i>55.5</i>	<i>sample was washed</i>
	55				<i>55.5</i>	<i>55.5</i>
	56		<i>limestone and sand</i>		<i>56.4</i>	
	57					
	58					
	59		<i>fine, brown, and gray</i>			<i>note the color of</i>
	60		<i>fine, brown, and gray</i>			<i>note the color of</i>
	61		<i>fine, brown, and gray</i>			<i>note the color of</i>
	62					
	63					
	64					
	65					
	66		<i>fine, brown, and gray</i>			
	67		<i>fine, brown, and gray</i>			
	68					

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <i>CN-D-1</i>	
PROJECT			INSTALLATION		SHEET <i>4</i> OF <i>10</i> SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
68			limestone			
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85			shale			
86			limestone			
87			limestone			
88						
89						
90						
91						
92						

LOG FORM
JAN 67

1836-A

(SR 1110-1-1801)

GPO 1960 OF - 626 - 601

PROJECT

HOLE NO.

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <i>CN-D-1</i>	
PROJECT			INSTALLATION		SHEET <i>5</i> OF <i>5</i> SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	92		Shale, dark gray, silty, clayey, medium bedded, weathering to brown, orange.			
	95				CD-7	
	94				CD-11	
	95		LOH			15 Jan 89
	96					
	97					
	98					
	99					
	100					
	101					
	102					
	103					
	104					
	105					

PRE-CONSTRUCTION NX and HQ DIAMOND CORE BORINGS

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT Cuchillo Dam Site		SWD		Albuquerque Dist.		1 OF 5 SHEETS	
2. LOCATION (Coordinates or Station) N 807 555, E 658405				10. SIZE AND TYPE OF BIT HQ			
3. DRILLING AGENCY Albuquerque District COE				11. DATUM FOR ELEVATION SHOWN (FSM or MSL) NGVD			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-1				12. MANUFACTURER'S DESIGNATION OF DRILL Longyear 44			
5. NAME OF DRILLER California Testing, Inc.				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				14. TOTAL NUMBER CORE BOXES 13		UNDISTURBED 0	
7. THICKNESS OF OVERBURDEN 3.4'				15. ELEVATION GROUND WATER Not Encountered			
8. DEPTH DRILLED INTO ROCK 97.1'				16. DATE HOLE 4 May 84		STARTED 10 May 84	
9. TOTAL DEPTH OF HOLE 100.5'				17. ELEVATION TOP OF HOLE 4716			
				18. TOTAL CORE RECOVERY FOR BORING 91		3	
				19. SIGNATURE OF INSPECTOR Steven Brewer		F.M. Fox of N.M.	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4716	0		Sand and Gravel, Clayey Some cobbles at Surface, Clayey (SC-6C)			Set-up 5-4-84 Begin Drilling 5/7/84 Drill rate 3 in/min	
	3.4		Sandstone, coarse to fine grained, conglomeratic, friable, weathered, poorly cemented, gray	32%		0% RQD - Very Poor	
	5		Limestone, micritic, well indurated, fossiliferous, gray hard to very hard. Sandstone, silty, friable Lt. Brown - 5.4 to 5.6'		Box 1	Common parallel calcite filled fractures @ 80°	
	8		Shale, calcareous, soft to mod. hard Limestone, as above, interbedded with calcareous shale. 1" to 4" beds.	96%	Box 2	RQD - 58% - Fair	
4706	10		Limestone, micritic, Some silty zones, well indurated, vertical to 80° fractures, hard to mod. hard, gray, weathering along fractures.	93%	Box 2	3 in/min Drill rate 89% RQD - Good	
	15			100%		75% RQD - Fair to Good	
			Shale, sandy, weathered, soft brown	63%		0% RQD - Very Poor	
			Limestone, as above, calcite filled fractures at 18.5 to 19.0'. Some Shale partings 1/4" thick	100%	Box 3	Lost circulation at 18.0' - 50% circulation restored at 18.5' 2.5 in/min Drill Rate 81% RQD - Good	
4696	20					Full Circulation at 20'	

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MAR 71

(TRANSLUCENT)

PROJECT
Cuchillo Dam Site

HOLE NO
CN-CH-1

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4716		Hole No. CN-CH-1		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque Dist		SHEET 2 OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4696	20		Limestone, micritic, fracturing limited, well indurated, hard to mod. hard, gray	100%	Box 3	
			Shale, calcareous, mod. hard gray			3 in/min Drill Rate
			Limestone, as above			99% RQD - Excellent
	25		Shale partings at 23.75, 24, 25, 27.4, 28, 29.8 and 33 feet.	97%	Box 4	End Shift 5/7/84 1.5 in/min Drill Rate
				98%		100% RQD - Excellent
4686	30			100%		RQD - 100%
					Box 5	4 in/min Drill rate
	35		Limestone, shaley, hard to very hard, calcite filled fracture @ 36.0'	100%		98% RQD - Excellent
	35.4					
	38		Shale, silty, soft, friable, gray-green	40%		0% RQD - Very Poor
4676	40		Shale, calcareous, mod. hard to hard, gray-green			1.5 in/min drill rate
			Limestone, with calcareous shale, hard, gray	100%	Box 6	87% RQD - Good 2 in/min drill rate
	43		Limestone, micritic, hard, gray			Using 300 to 400 gal. of water per 5' run.
4672	40					

ENG FORM 1836-A
JUN 67

U.S. GEOLOGICAL SURVEY

PROJECT

HOLE NO

Cuchillo Dam Site

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4716		Hole No. CN-CH-1		
PROJECT Cochillo Dam Site		INSTALLATION Albuquerque Dist		SHEET 3 OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc. if 1' > 10')
4672	44		Limestone - as above			
4671	45			100%	Box 6	Lost circulation at 450' - regained approximately 40% 77% RQD - Good
	47		Shale, calcareous, with some sand and silt, lt Brown - 47.0 - 47.2 and 47.9' - 48.1'			1/2" fracture 76° from horiz. calcite filled.
	48					
			Limestone, micritic, fossiliferous, hard to very hard, gray, some calcite filled fractures.	100%		RQD - 82% - Good
4666	50				Box 7	
						3 in/min Drill Rate
				100%		82% RQD - Good
	55					
				100%	Box 8	100% RQD - Excellent
4656	60					
	62.3		Shale, weathered, soft to mod hard, interbedded with	88%		43% RQD - Poor
	63		Limestone, micritic, fossiliferous, hard, gray	85%		0% RQD - Very Poor
				75%		0% RQD - Very Poor
	65		Shale, calcareous, soft to mod. hard, gray-green	83%		30% RQD - Poor
				45%	Box 9	
				90%		0% RQD - Very Poor 1 in/min Drill rate
	68			70%		
			Limestone, micritic, hard to Very hard			
4647	69					0% RQD - Very Poor

ENG FORM 1835-A
JUN 57

Cochillo Dam Site CN-CH-1

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4716		Hole No. CN-CH-1		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque District		SHEET 5 OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering etc., if significant) g
4647	69		Limestone, shaley, mod. hard to hard, gray to gray-green, with shale partings	100%	Box 9	91% RQD - Excellent
4646	70					
	72.8		Shale, friable, green to gray-green	100%		
				50%		RQD - 0% - Very Poor
	74		Limestone, shaley, soft to hard, gray to gray-green, shale partings			
	75		Limestone, micritic, hard to very hard, gray, some green shale partings,	100%	Box 10	98% RQD - Excellent
	76.1		Limestone, shaley, with inter-bedded shale, gray to gray-green, mod. hard to hard			1.5 in/min Drill rate Calcite filled vertical fractures at 79-80'
4636	80		VOID - 80.3 to 81.2'			No return on drill fluid 80.3-81.2 -
		VOID		85%		Regained drill fluid at 82'
					Box 11	3 in/min Drill rate
	85		Sandstone, argillaceous, poorly cemented, weathered brown			67% RQD - Good
			Limestone, shaley, mod. hard to hard, gray to gray-green, less shaley below 87'. Some calcite fractures	92%		
	87					
	88.6		Limestone, micritic, fossiliferous, hard, gray			1.5 in/min Drill rate
4626	90		Shale, calcareous, silty, moderately hard, brown	100%	Box 12	79% RQD - Good
				99%		85% RQD - Good

ENG FORM 1836-A
JUN 57

PROJECT
Cuchillo Dam Site

HOLE NO.
CN-CH-1

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4716		Hole No. CA-1-CH-1		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque Dist		SHEET 5 OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERED e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4625	93		Shale, as above	60%	Box 12	
4621	95		More calcareous at 95'			0% RQD - Very Poor
	96.4		Limestone, shaley, mod. hard, weathered 97 to 98'	80%	Box B	.75 in/min Drill Rate
			Limestone, some shale, micritic			71% RQD - Fair
4616	100					
	100.5		Bottom of Hole			Hole ended 5/10/84

ENG FORM 1836-A

670 1000 BT-100 540

PROJECT

HOLE NO

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT Cochillo Dam Site		SWD		Albuquerque District		1 OF 3 SHEETS	
2. LOCATION (Coordinates or Station) N 807.474, E 658.226				10. SIZE AND TYPE OF BIT H2			
3. DRILLING AGENCY Albuquerque District, COE				11. DATUM FOR ELEVATION SHOWN (FSN - MSL) NLVD			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-2				12. MANUFACTURER'S DESIGNATION OF DRILL Long year 44			
5. NAME OF DRILLER California Testing, Inc				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				14. TOTAL NUMBER CORE BOXES 4		UNDISTURBED 0	
7. THICKNESS OF OVERBURDEN 36'				15. ELEVATION GROUND WATER 4586			
8. DEPTH DRILLED INTO ROCK 26'				16. DATE HOLE STARTED 4/24/84 COMPLETED 5/1/84			
9. TOTAL DEPTH OF HOLE 62'				17. ELEVATION TOP OF HOLE 4618			
				18. TOTAL CORE RECOVERY FOR BORING 87			
				19. SIGNATURE OF INSPECTOR Steven Brewer, F.M. Fox of NM			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	1. CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4618	0		Sand and gravel, some silt and cobbles. Sand med. to fine grain. (SP-6P)			4 min/ft Drill Rate	
4608	10					Circulation and caving problems.	
4598	20		Sand, Finer grained below 14'; less gravel than above			9 min/ft Drill Rate Reamed hole with Hw to 15' to use as surface casing.	

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-2		
PROJECT		INSTALLATION		SHEET 2		
Cuchillo Dam Site		Albuquerque District		OF 3 SHEETS		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering etc., if significant)
a	b	c	d	e	f	g
4598	20					7min/ft Drill rate
	25					
	30					
4588	30					
	35					
	36					
			Limestone, micritic, near surface iron stained, well indurated, hard gray - some calcite filled fractures	97%		100% RQD - Excellent Drill rate 18'/min
				100%		
4578	40			100%	Box 1	100% RQD - Excellent
				100%		96% RQD - Excellent 7min/ft - Drill rate
	43		Limestone, shaley with Some sand 42.7 to 43.2	100%		
4574	44					

ENG FORM 1836-A
JUN 67

PROJECT Cuchillo Dam Site
HOLE NO CN-CH-2

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4618		Hole No. CN-CH-2			
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque District		SHEET 3 of 3 SHEETS			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4574	44		Limestone, fine grained, shaley and silty, hard gray - some Calcite filled fractures	100%	Box 2	4in/min Drill rate 100% RQD- Excellent 3in/min Drill Rate 100% RQD- Excellent	
	45						
	482						
4568	50		Limestone, micritic, little shale, hard, gray Some hematite staining 50-52'	91%	Box 3	RQD-97% - Excellent 2 in/min Drill Rate	
				98%			
	55						
					Box 3		
	57		Limestone, Shaley, silty some hematite staining, Soft to med. hard.	100%	Box 4	3in/min Drill Rate Began using NX core size	
				100%			
4558	60						
			Shale, calcareous, some weathering, red-gray	72%			
	62		Bottom of Hole			Completed Hole 1 May 84	

ENG FORM 1835-A

Cuchillo Dam Site CN-CH-2

DRILLING LOG		SWD	Albuquerque District	10 of 4 SHEETS
1. PROJECT Cuchillo Dam Site		10. SIZE AND TYPE OF BIT HQ - Diamond		
2. LOCATION (Coordinates or Station) N 807.381 : E 658.017 4		11. DATUM FOR ELEVATION SHOWN (FWS - MSL) NGVD		
3. DRILLING AGENCY Albuquerque Dist. COE		12. MANUFACTURER'S DESIGNATION OF DRILL Longyear 44		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-3		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 0 0		
5. NAME OF DRILLER California Testing, Inc		14. TOTAL NUMBER CORE BOXES 10		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER Not Encountered		
7. THICKNESS OF OVERBURDEN 0.4'		16. DATE HOLE STARTED 3 May 84 COMPLETED 4 May 84		
8. DEPTH DRILLED INTO ROCK 78.6'		17. ELEVATION TOP OF HOLE 4741		
9. TOTAL DEPTH OF HOLE 79'		18. TOTAL CORE RECOVERY FOR BORING B7		
		19. SIGNATURE OF INSPECTOR Steven Brewer, FM. Fox of NM		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
4741	0		Sand, silty (SM)			
	0.4		Limestone, fossiliferous, mod. hard to hard, some vertical fractures filled with calcite. Some weathering 0.4 to 1.0'. Hematite staining at 2.0', 3.75 and 4.25'	92%	Box 1	4 in/min Drill Rate 96% RQD Excellent
	5		Limestone, as above hard to very hard			
	10			86%		3 in/min Drill Rate 98% RQD - Excellent
4731	10		some shale partings 12 - 13'	100%	Box 2	99% RQD - Excellent
	15					
4721	20			100%	Box 3	2.5 in/min Drill Rate 96% RQD Excellent

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MAR 71

PROJECT
Cuchillo Dam Site

HOLE NO
CN-CH-3

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4741		Hole No. CN-CH-3		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque Dist		SHEET 2 OF 4 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, dip of weathering, etc., if significant) g
4721	20					
					Box 3	
				100%		81% RQD - Good
	25		Limestone, micritic, silty very hard, pink-gray some fracturing with calcite filling			
					Box 4	
				100%		88% RQD - Good
4711	30					
				100%		98% RQD Excellent
	35		Siltstone, shaley, friable, highly fractured, calcareous, red brown to yellow-brown	100%		48% RQD - Poor
	36		Limestone, silty, hard, gray		Box 5	
	36.4		Siltstone, as above			4in/min Drill Rate
	37.5		Limestone, silty, some sand, iron stained, very hard, pink gray	95%		94% RQD - Excellent
4701	40					
					Box 6	4in/min Drill Rate
				95%		93% RQD - Excellent
4697	44					

ENG FORM 1836-A
JAN 67

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PROJECT
Cuchillo Dam Site
HOLE NO
CN-CH-3

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4741		Hole No. CN-CH-3		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque District		SHEET 3 OF 4 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4697	44		Limestone micritic, some silt, hard to very hard, some iron staining, pink-gray. Some frad- uring calcite filled.		Box 6	
	45					3 in/min Drill Rate 97% RQD - Excellent
				100%		
4691	50				Box 7	Circulation Loss 49.6 Vertical fracture 49.6 to 50.5'. Regained circulation at 51'
				98%		71% RQD - Fair 4.5 in/min Drill Rate
	55					
				100%		2 in/min Drill Rate
	57.5		Shale, red, some silt			4 in/min Drill Rate
					Box B	No core recovery 57.5 to 63.3'
4681	60			0		
	63.3		Limestone, shaley, hard to very hard, gray to red-brown			2 in/min Drill Rate
						84% RQD - Good
	65			97%		
	65.5		Limestone, micritic, very hard, gray, some vertical calcite filled fractures		Box 9	
4673	66					

ENG FORM 1836-A
JUN 67

Cuchillo Dam Site CN-CH-3

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-C14-3		
PROJECT		INSTALLATION		SHEET 4 OF 4 SHEETS		
Cuchillo Dam Site		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
4673	65					2 in/min Drill Rate
	68.8		Limestone, shaley, mod. hard to hard, fracturing calcite filled.	100%	Box 9	96% RQD - Excellent
4671	70					2 in/min Drill Rate
				100%		100% RQD - Excellent
	72.5		Limestone, as above, with hematite staining more prevalent			91% RQD Excellent
				92%		
	75				Box 10	24% RQD - Poor
				94%		
	77.4		Shale, weathered, red-brown soft to mod. hard	100%		75% RQD - Fair to Good
						1 in/min Drill Rate
4662	79		Bottom of Hole			Hole completed 5/4/84

ENG FORM 1836-A
APR 67

SEE INSTRUCTIONS

FORM

HOLE NO

DRILLING LOG		SWD		Albuquerque District		SHEET 1 OF 4 SHEETS	
1. PROJECT Cuchillo Dam Site				10. SIZE AND TYPE OF BIT 3 3/8" Tricone / NIX Dione			
2. LOCATION (Coordinates or Station) N 807.245; E 657.564				11. DATUM FOR ELEVATION SHOWN (TBM = 100) NGVD			
3. DRILLING AGENCY Albuquerque District, COE				12. MANUFACTURER'S DESIGNATION OF DRILL Longyear 44			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-4				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0			
5. NAME OF DRILLER California Testing, Inc				14. TOTAL NUMBER CORE BOXES 2			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER Not Encountered			
7. THICKNESS OF OVERBURDEN 59'				16. DATE HOLE STARTED 1 May 84 COMPLETED 2 May 84			
8. DEPTH DRILLED INTO ROCK 13'				17. ELEVATION TOP OF HOLE 4732			
9. TOTAL DEPTH OF HOLE 75'				18. TOTAL CORE RECOVERY FOR BORING 86 %			
				19. SIGNATURE OF INSPECTOR Steven Brewer, F.M. Fox of NM			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
4732	0		Clay, sandy to Sand, clayey; coarse to fine grained, slightly gravelly to gravelly, calcareous, light brown (SC-CL)			Drilling with Quick Gel. Soil classifications shown in () are field classifications 1.5'/min Drill Rate	
	5						
	9						
4722	10		Sand, some silt, gravelly, some cobbles, gray (SP-SM)				
	11		Sand, clayey, fine grained, some gravel, brown (SC)				
	15						
	16		Sand, some silt, fine grained, some gravel, some clay, gray (SP-SM) Occasional gravel lens			- Drilling with water only 0.5 ft/min Drill rate	
4712	20						

ENG FORM 1836
MAR 71

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(TRANSLUCENT)

PROJECT

Cuchillo Dam Site

HOLE NO

CN-CH-4

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4732		Hole No. CN-CH-4		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque District		SHEET 2 OF 4 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4712	20					
	25					
4702	30					
	31		Gravel lens			
	30.5		Sand, as above			
	35					
4692	40					
			Gravel lens			

1.5 ft/min Drill Rate

4 in/min Drill Rate

4688 44
END FORM 1836-A
NO. 27

4688 44
Cuchillo Dam Site CN-CH-4

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4732		Hole No. CN-CH-4		
PROJECT Cochillo Dam Site		INSTALLATION Albuquerque District		SHEET 3 OF 4 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4688	44					
	45		Gravel, some coarse sand (GP)			lost Circulation
	48		Sand, some silt and gravel, gray (SP-SM)			Using Quick Gel - regained Circulation at 47'
4682	50					8 in/min Drill Rate
	52.5		Gravel, some coarse sand (GP)			
	55		Sand, silty, some gravel gray (SP-SM)			3 in/min Drill Rate
	59					
4672	60		Limestone, micritic, hard to very hard, gray some iron staining	92%		Began NX coring at 60'
	62		Limestone, silty, hard light brown			80% RQD - Good
	62.8		Shale, silty, weathered, soft, light brown			4 in/min Drill Rate
	64		Limestone, fossiliferous, hard	75%	Box 1	
	65					
4664	66		Shale, silty, weathered			

ENG FORM 1836-A
APR 67

U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

WATER RESOURCES DIVISION

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4732		Hole No. CN-CH-4		
PROJECT Cuchillo Dam Site		INSTALLATION Albuquerque District		SHEET 4 OF 4 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4664	68	---	Shale, as above			66% RQD - Fair
	68.8	---	Limestone, micritic, hard to very hard, gray	93%	Box 2	
	70	---				
	71.6	---	Shale, as above			
	72	---	Bottom of Hole			16' Completed 2 May 84

ENG FORM 1836-A
JUN 67

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS		
1. PROJECT CUCHILLO NEGRO CREEK			10. SIZE AND TYPE OF BIT 2 7/8" DIAMOND (NR)			
2. LOCATION (Coordinate or Station) SEE LAYOUT			11. DATUM FOR ELEVATION SHOWN (FMS or MSL)			
3. DRILLING AGENCY USCE (SOUTHWEST ENGR - P.S.T)			12. MANUFACTURER'S DESIGNATION OF DRILL MOBILE B-61			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-5			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0			
5. NAME OF DRILLER RAY PERGESON			14. TOTAL NUMBER CORE BOXES Box #1			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER NOT ENCOUNTERED			
7. THICKNESS OF OVERBURDEN 31.0' ±			16. DATE HOLE STARTED 21 MAY 86 COMPLETED 21 MAY 86			
8. DEPTH DRILLED INTO ROCK 19.0' ±			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE 50.0'			18. TOTAL CORE RECOVERY FOR BORING 75 %			
19. SIGNATURE OF INSPECTOR <i>James R. [Signature]</i>						
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0.0		2.0' To 4.5' ± GRAVEL: FINE TO LARGE; ROUNDED - ANGULAR; DRY; LIMY; SILTY; SANDY; WITH SURFACE COBBLES & BOULDERS			1. DRILLING: 6 5/8" HOLLOW STEM FLIGHT AUGER: 0.0' - 40.3' 2 7/8" (NR) CORE BARREL: 40.3' - 50.0'
			4.5' ± To 9.0' ± GRAVEL: FINE - MEDIUM; ROUNDED - ANGULAR; DRY; LIMY; VERY SILTY;			2. NOTE: NO OVER-BURDEN SAMPLES WERE RETAINED; CORE WAS BOXED FROM CORED SECTION.
			9.0' ± To 17.2' ± SILT: REDDISH BROWN; HARD; DRY; LIMY; WITH SCATTERED FINE GRAVEL; CLAYEY			3. NOTE: NO CARTON SAMPLES OF CORE WERE OBTAINED.
			17.2' ± To 31.0' ± SILTSTONE / SANDSTONE: BADLY WEATHERED; BROWN - REDDISH BROWN; SOFT - VERY SOFT; DRY; CALCAREOUS; WEAKLY CEMENTED; PREDOMINANTLY FINE GRAINED; SLIGHTLY CONGLOMERATIC 20.5' ± - 23.5' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER 25.0' ± - 31.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			4. BORING LOCATION: NOTE: BORING WAS LOCATED BY SWA.; NOTE: BORING WAS BACKFILLED AFTER DRILLING
			31.0' ± To 40.3' SHALE: BADLY WEATHERED; YELLOWISH BROWN, PURPLE & LIGHT GRAY; SOFT - VERY SOFT; DRY; CALCAREOUS; CLAYEY			5. NOTE: TOP OF ROCK TAKEN AS TOP OF WELL DEFINED OLDER DIPPING BEDS

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PROJECT: CUCHILLO NEGRO CREEK HOLE NO: CN-CH-5

Hole No. CN-CH-5

DRILLING LOG		DIVISION	INSTALLATION	SHEET <u>2</u> OF <u>2</u> SHEETS
1. PROJECT <u>CUCHILLO NEGRO CREEK</u>			10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or BSL)	
3. DRILLING AGENCY			12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number) <u>CN-CH-5</u>			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED <u>21 MAY 86</u> COMPLETED <u>21 MAY 86</u>	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE			18. TOTAL CORE RECOVERY FOR BORING	
			19. SIGNATURE OF INSPECTOR <i>James R. Hester</i>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIAL (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			<u>40.3 ± to 41.3 ±</u> <u>LIMESTONE: DULL LIGHT</u> <u>RED; SLIGHTLY WEATH-</u> <u>ERED; BADLY BROKEN; L: 3.0'</u> <u>MODERATELY HARD -</u> <u>HARD</u>	<u>40.3</u>		<u>NOTE: LOST CORE FROM</u> <u>42.0' - 45.0'</u> <u>NOTE: DETERMINATION</u> <u>OF DIP FROM CORED</u> <u>SECTION IS UNRELIABLE</u>
			<u>41.3 ± to 46.5 ±</u> <u>SILTSTONE: PALE REDDISH</u> <u>BROWN (DRIES TO A</u> <u>LIGHTER BROWN);</u> <u>MODERATELY SOFT; L: 3.3'</u> <u>VERY CALCAREOUS; DRY;</u> <u>SANDY; BADLY WEATH-</u> <u>ERED; HIGHLY FRAC-</u> <u>TURED & BROKEN</u>	<u>45.0</u>	<u>Box</u> <u>#1</u>	<u>NOTE: LOST CORE FROM</u> <u>46.7' - 50.0'</u>
			<u>46.5 ± to 50.0' T.D.</u> <u>SHALE: RED WITH PURPLE</u> <u>& YELLOW; BADLY WEATH-</u> <u>ERED; SOFT - VERY SOFT;</u> <u>DRY; CALCAREOUS; SANDY</u> <u>T.D. 50.0'</u>	<u>50.0</u>		

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MAR 71 (TRANSLUCENT)

PROJECT CUCHILLO NEGRO CREEK HOLE NO. CH-CN-5

File No. CN-CH-5.1

DRILLING LOG		DIVISION SWD	INSTALLATION SWA	SHEET 1 OF 2 SHEETS		
1. PROJECT CUCHILLO NEGRO CREEK			10. SIZE AND TYPE OF BIT 2 7/8" DIAMOND (NX)			
2. LOCATION (Coordinate or Station) SEE REMARKS # 4			11. DATUM FOR ELEVATION SHOWN (FSM or MSL)			
3. DRILLING AGENCY USCE (SOUTHWEST ENGR. - PSI)			12. MANUFACTURER'S DESIGNATION OF DRILL MOBILE B-61			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-5A			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN: DISTURBED UNDISTURBED 0 0			
5. NAME OF DRILLER RAY PERGESON			14. TOTAL NUMBER CORE BOXES Box # 1			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER NOT ENCOUNTERED			
7. THICKNESS OF OVERBURDEN 31.0' ±			16. DATE HOLE STARTED COMPLETED 22 MAY 86 22 MAY 86			
8. DEPTH DRILLED INTO ROCK 31.5' ±			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE 62.5'			18. TOTAL CORE RECOVERY FOR BORING 80 %			
			19. SIGNATURE OF INSPECTOR <i>James R. Stokes</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		NOTE: REFER TO LOG OF BORING CN-CH-5 FOR CLASSIFICATION OF MATERIALS FROM 0.0'- 50.0')			1. DRILLING: 6 5/8" HOLLOW STEM AUGER: 0.0' - 60.0' 2 7/8" OD (NX) CORE BARREL: 60.0' - 62.5' NOTE: HAD TROUBLE BREAKING CORE AT 62.5'; FINALLY TWISTED OF DIA- MOND BIT AT 62.0'; ABANDONED BORING.
	20					
						3. CARTON SAMPLES: C-1: 61.0' - 62.0'
						5. NOTE: TOP OF ROCK TAKEN AS TOP OF WELL DEFINED OLDER DIPPING BEDS

6 5/8" HOLLOW STEM FLIGHT AUGER

ENG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE
(TRANSLUCENT)

PROJECT
CUCHILLO NEGRO CREEK

HOLE NO.
CN-CH-5A

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 2 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (FSM or MSL)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-5A				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER				14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE STARTED 22 MAY 86 COMPLETED 22 MAY 86		17. ELEVATION TOP OF HOLE	
7. THICKNESS OF OVERBURDEN				18. TOTAL CORE RECOVERY FOR BORING		18. TOTAL CORE RECOVERY FOR BORING	
8. DEPTH DRILLED INTO ROCK				19. SIGNATURE OF INSPECTOR <i>Jack R. Stehman</i>		19. SIGNATURE OF INSPECTOR	
9. TOTAL DEPTH OF HOLE				20. CORE RECOVERY		20. CORE RECOVERY	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	20. CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
50.0			50.0± to 58.0± SHALE: RED; BADLY WEATHERED; SOFT; DRY; CALCAREOUS; SANDY				
58.0			58.0± to 62.5' T.D. LIMESTONE: UNWEATHERED; REDDISH GRAY; HARD; VERY HARD; DENSE; CRYSTALLINE; WITH OCCASIONAL WELL CEMENTED HIGH ANGLE FRACTURE T.D. 62.5'	60.0 R: 2.0 62.5	Box #1	NOTE: DETERMINATION OF DIP FROM CORED SECTION IS UNRELIABLE	
62.5							

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
		SWD	SWA	1 OF 3 SHEETS		
1. PROJECT CUCHILLO NEGRO CREEK			10. SIZE AND TYPE OF BIT 2 7/8" DIA (NR)			
2. LOCATION (Coordinate or Station) SEE LAYOUT			11. DAYUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY USCE (SOUTHWEST ENGR. / P.S.I.)			12. MANUFACTURER'S DESIGNATION OF DRILL MOBILE B-61			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-6			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0			
5. NAME OF DRILLER RAY PERGESON			14. TOTAL NUMBER CORE BOXES Box #1			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER NOT DETERMINED			
7. THICKNESS OF OVERBURDEN 101.0' ±			16. DATE HOLE STARTED 27 MAY 86 COMPLETED 3 JUNE 86			
8. DEPTH DRILLED INTO ROCK 6.5' ±			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE 107.5'			18. TOTAL CORE RECOVERY FOR BORING 57%			
			19. SIGNATURE OF INSPECTOR <i>James R. Stiles</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		0.0' TO 9.5' ± GRAVEL: FINE TO LARGE; ROUNDED - ANGULAR; DRY; LIMY; VERY SILTY; SLIGHTLY SANDY; WITH SURFACE COBBLES & BOULDERS			1. DRILLING: 6 5/8" HOLLOW STEM FLIGHT AUGER 0.0' - 100.0' 2 7/8" (NR) CORE BARREL: 100.0' - 107.5'
			9.5' ± TO 16.0' ± SILT: REDDISH BROWN; HARD; DRY; LIMY; WITH SCATTERED FINE GRAVEL; CLAYEY			2. NOTE: NO OVER- BURDEN SAMPLES WERE RETAINED; NOTE: RECOVERED CORE WAS BOXED.
			16.0' ± TO 52.0' ± SILTSTONE / SANDSTONE: BADLY WEATHERED; BROWN-REDDISH BROWN; SOFT-VERY SOFT; DRY; CALCAREOUS; WEAKLY CEMENTED; PREDOM- INANTLY FINE GRAINED; SLIGHTLY CONGLOMERATIC 23.0' ± - 27.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			3. BORING LOCATION: NOTE: BORING WAS LOCATED BY SWA.
			35.0' ± - 52.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			4. NOTE: NO FREE WATER ENTERING BORING DURING AUGERING FROM 0.0' - 100.0'
						6 5/8" HOLLOW STEM FLIGHT AUGER

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 3 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinates or Station)				11. DAY ON FOR ELEVATION KNOWN (75% or less)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-6				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	
5. NAME OF DRILLER				14. TOTAL NUMBER CORE BOXES		UNDISTURBED	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER		16. DATE HOLE STARTED 27 MAY 86 COMPLETED 3 JUNE 86	
7. THICKNESS OF OVERBURDEN				17. ELEVATION TOP OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	
8. DEPTH DRILLED INTO ROCK				19. SIGNATURE OF INSPECTOR <i>James R. Hines</i>		20. TOTAL DEPTH OF HOLE	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIAL (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
			52.0'± TO 101.0'± GRAVEL/CONGLOMERATE: FINE TO LARGE; ROUNDED- ANGULAR; DENSE; DRY; CALCAREOUS; IN A REDDISH BROWN, VERY SILTY BINDER; SLIGHTLY SANDY; WITH SOME WEAK CEMENTATION; LESS GRAVEL & MORE SILT FROM 87.0'± - 101.0'±				

DRILLING LOG		DIVISION	INSTALLATION	SHEET 3 OF 3 SHEETS
1. PROJECT CUCHILLO NEGRO CREEK			10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)			11. DAYUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY			12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number) CN-CH-6			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN			16. DATE HOLE STARTED 27 MAY '86 COMPLETED 3 JUNE '86	
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE			18. TOTAL CORE RECOVERY FOR BORING	
			19. SIGNATURE OF INSPECTOR <i>Jack R. K. [Signature]</i>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			NOTE: CORED THROUGH SOME DENSE COBBLES FROM 100.0'± - 101.0'±			
100			101.0'± TO 102.0'±	100.0		NOTE: LOST CORE FROM 100.0'± - 101.3'±
101.0			LIMESTONE: UNWEATHERED: GRAY: HARD (DIFFICULT TO CORE): BADLY BROKEN; DENSE	L: 1.3		
			102.0'± TO 107.5' T.D.	102.5		NOTE: LOST CORE FROM 102.5'± - 105.5'±
			CLAY SHALE: BADLY WEATHERED: SOFT - VERY SOFT; DRY - DAMP; CALCAREOUS;	L: 3.0	Box #1	
107.5			102.0'± - 106.0'±: YELLOWISH BROWN; VERY SILTY; DRY	107.5		
			106.0'± - 107.0'±: OLIVE BROWN: VERY CLAYEY; DAMP			
			107.0'± - 107.5'±: REDDISH BROWN; SLIGHTLY SILTY; DRY			
			T.D. 107.5'			

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PROJECT: **CUCHILLO NEGRO CREEK** HOLE NO: **CN-CH-6**

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS		
1. PROJECT CUCHILLO NEGRO CREEK		SWD	SWA			
2. LOCATION (Coordinates or Station) SEE LAYOUT		10. SIZE AND TYPE OF BIT 6 5/8" AUGER				
3. DRILLING AGENCY USCE (SOUTHWEST ENGR. / P.S.I.)		11. DAY ON FOR ELEVATION BOUND (YES - NO)				
4. HOLE NO. (As shown on drawing title and file number) CN-CH-7		12. MANUFACTURER'S DESIGNATION OF DRILL MOBILE B-6L				
5. NAME OF DRILLER RAY PERGESON		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED: 0 UNDISTURBED: 0				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES NONE				
7. THICKNESS OF OVERBURDEN 46.0' ±		15. ELEVATION GROUND WATER NOT ENCOUNTERED				
8. DEPTH DRILLED INTO ROCK 4.0' ±		16. DATE MOLE STARTED: 22 MAY 86 COMPLETED: 22 MAY 86				
9. TOTAL DEPTH OF HOLE 50.0'		17. ELEVATION TOP OF HOLE				
		18. TOTAL CORE RECOVERY FOR BORING N/A				
		19. SIGNATURE OF INSPECTOR <i>James R. [Signature]</i>				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		0.0' TO 5.8' ± GRAVEL: FINE TO LARGE; ROUNDED - ANGULAR; DRY; LIMY; VERY SILTY (BORDERS A GRAVELLY SILT); WITH SURFACE COBBLES & Boulders			1. DRILLING: 6 5/8" HOLLOW STEM FLIGHT AUGER: 0.0' - 50.0'
			5.8' ± TO 8.5' ± GRAVEL: FINE TO LARGE; ROUNDED - ANGULAR; DRY; LIMY; SILTY			2. NOTE: NO OVER-BURDEN SAMPLES WERE RETAINED; NOTE: NO CORE WAS TAKEN
			8.5' ± TO 13.0' ± SILT: REDDISH BROWN; HARD; DRY; LIMY; CLAYEY			3. BORING LOCATION: NOTE: BORING WAS LOCATED BY SWA. NOTE: BORING WAS BACKFILLED AFTER DRILLING.
			13.0' ± TO 46.0' ± SILTSTONE/SANDSTONE: BADLY WEATHERED; BROWN-REDDISH BROWN; SOFT-VERY SOFT; DRY; CALCAREOUS; WEAKLY CEMENTED; PREDOMINANTLY FINE GRAINED; SLIGHTLY CONGLOMERATIC			4. NOTE: TOP OF ROCK TAKEN AS TOP OF WELL DEFINED OLDER DIPPING BEDS
	20		22.0' ± - 26.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			
			28.5' ± - 34.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			
	40		39.5' ± - 46.0' ±: SLIGHTLY			

ENG FORM 1836
MAR 71

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PROJECT
CUCHILLO NEGRO CREEK

HOLE NO.
CN-CH-7

DRILLING LOG			DIVISION	INSTALLATION	SHEET 2 OF 2 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK			10. SIZE AND TYPE OF BIT		11. DATUM FOR ELEVATION SHOWN (YSM - MSL)	
2. LOCATION (Coordinate or Station)			12. MANUFACTURER'S DESIGNATION OF DRILL		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
3. DRILLING AGENCY			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	
4. HOLE NO. (As shown on drawing title and file number)			14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER	
5. NAME OF DRILLER			16. DATE HOLE		STARTED	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			17. ELEVATION TOP OF HOLE		COMPLETED	
7. THICKNESS OF OVERBURDEN			18. TOTAL CORE RECOVERY FOR BORING		%	
8. DEPTH DRILLED INTO ROCK			19. SIGNATURE OF INSPECTOR			
9. TOTAL DEPTH OF HOLE						
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
			MORE CEMENTED; WITH LESS SILT & CLAY BINDER			
46.0			46.0' to 49.0' LIMESTONE: MODERATELY WEATHERED; REDDISH BROWN; MODERATELY HARD			NOTE: MATERIAL WAS NOT COMING TO SURFACE FROM 46.0'; ADDED SOME WATER & CREATED LOTS OF "MUCK" & MADE IT DIFFICULT TO LOG.
50.0			49.0' to 50.0' T.D. SHALE: BADLY WEATHERED; RED; SOFT - VERY SOFT; CLAYEY			
			T.D. 50.0'			

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT CUCHILLO NEGRO CREEK HOLE NO. CN-CN-7

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
PROJECT		SWD		SWA		1 OF 2 SHEETS	
CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT		2 7/8" DIAMOND (NX)	
3. LOCATION (Coordinate or Station)				11. DAYUM FOR ELEVATION SHOWN (True - MSL)			
SEE REMARKS # 3				12. MANUFACTURER'S DESIGNATION OF DRILL		MOBILE B-61	
4. DRILLING AGENCY				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
USCE (SOUTHWEST ENGR. - P.S.T.)				14. TOTAL NUMBER CORE BOXES		Box # 1	
5. HOLE NO. (As shown on drawing title and file number)		CN-CH-7A		15. ELEVATION GROUND WATER		NOT ENCOUNTERED	
6. NAME OF DRILLER		RAY PERGESON		16. DATE HOLE		STARTED 28 MAY 64 COMPLETED 28 MAY 64	
7. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		17. ELEVATION TOP OF HOLE			
8. THICKNESS OF OVERBURDEN		42.0' ±		18. TOTAL CORE RECOVERY FOR BORING		65 %	
9. DEPTH DRILLED INTO ROCK		5.0' ±		19. SIGNATURE OF INSPECTOR		John R. Hoban	
10. TOTAL DEPTH OF HOLE		47.0'					
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	0.0		NOTE: REFER TO LOG OF BORING CN-CH-7 FOR CLASSIFICATION OF MATERIALS FROM 0.0' - 42.0'			1. DRILLING: 6 3/8" HOLLOW STEM FLIGHT AUGER: 0.0' - 45.0' 2 7/8" OD (NX) CORE BARREL: 45.0' - 47.0'	
	20					2. NOTE: NO OVER-BURDEN SAMPLES WERE RETAINED; CORE WAS BOXED FROM 45.0' - 47.0'	
						3. BORING LOCATION: NOTE: BORING WAS OFFSET 10.0' SO. OF CN-CH-7.	
						4. NOTE: TOP OF ROCK TAKEN AS TOP OF WELL DEFINED OLDER DIPPING BEDS	
	40					6 5/8" HOLLOW STEM FLIGHT AUGER	

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE
(TRANSLUCENT)PROJECT
CUCHILLO NEGRO CREEKHOLE NO.
CN-CH-7A

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 2 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinate or Station)				11. DAY OF YEAR FOR ELEVATION SHOWN (YBM = REL.)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and file number)				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		14. TOTAL NUMBER CORE BOXES	
5. NAME OF DRILLER				15. ELEVATION GROUND WATER		16. DATE HOLE	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				17. ELEVATION TOP OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	
7. THICKNESS OF OVERBURDEN				19. SIGNATURE OF INSPECTOR		20. SIGNATURE OF DRILLER	
8. DEPTH DRILLED INTO ROCK				21. SIGNATURE OF DRILLER			
9. TOTAL DEPTH OF HOLE				22. SIGNATURE OF DRILLER			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIAL (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
42.0			42.0' ± TO 45.3' ± SILTSTONE: MODERATELY WEATHERED; LIGHT REDDISH BROWN; DRY; MODERATELY SOFT- MODERATELY HARD; VERY CALCAREOUS	45.0		NOTE: LOST CORE FROM 45.5' ± - 46.2' ± NOTE: DETERMINATION OF DIP FROM CORED SECTION IS UNRELIABLE	
47.0			45.3' ± TO 46.4' ± SHALE: BADLY WEATHERED; RED & LIGHT GRAY; VERY SOFT; DAMP; CLAYEY; CALCAREOUS	47.0			
			46.4' ± TO 47.0' T.D. LIMESTONE: ESSENTIALLY UNWEATHERED; LIGHT REDDISH GRAY-GRAY; HARD-VERY HARD; DENSE; CRYSTALLINE; WITH AN OCCASIONAL WELL CE- MENTED FRACTURE T.D. 47.0'				

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE
MAR 71 (TRANSLUCENT)

PROJECT CUCHILLO NEGRO CREEK HOLE NO. CN-CH-7A

DRILLING LOG			DIVISION		INSTALLATION		SHEET	
1. PROJECT CUCHILLO NEGRO CREEK			SWD		SWA		1 OF 3 SHEETS	
2. LOCATION (Coordinate or Station) SEE LAYOUT			10. SIZE AND TYPE OF BIT 2 7/8" DIA. (NX)					
3. DRILLING AGENCY USCE (SOUTHWEST ENGR. / P.S.E.)			11. DAY(S) FOR ELEVATION SHOWN (YR - M - DAY)					
4. HOLE NO. (As shown on drawing title and file number) CN-CH-B			12. MANUFACTURER'S DESIGNATION OF DRILL MOBILE B-61					
5. NAME OF DRILLER RAY PERGESON			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN					
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			14. TOTAL NUMBER CORE BOXES Box #1					
7. THICKNESS OF OVERBURDEN 97.5' ±			15. ELEVATION GROUND WATER NOT DETERMINED					
8. DEPTH DRILLED INTO ROCK 0.5' ±			16. DATE HOLE 29 MAY 86 30 MAY 86					
9. TOTAL DEPTH OF HOLE 98.0'			17. ELEVATION TOP OF HOLE					
			18. TOTAL CORE RECOVERY FOR BORING 44%					
			19. SIGNATURE OF INSPECTOR <i>John R. Baker</i>					
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g		
	0.0		0.0' TO 10.0' ± GRAVEL: FINE TO LARGE; ROUNDED - ANGULAR; DRY; LIMY; SILTY; SANDY; WITH SURFACE COBBLES & BOULDERS; VERY SILTY FROM 7.0' WITH FINER GRAVEL			1. DRILLING: 6 5/8" HOLLOW STEM FLIGHT AUGER: 0.0' - 45.0' 2 7/8" (NX) CORE BARREL: 45.0' - 50.0' 6 5/8" HOLLOW STEM FLIGHT AUGER: 45.0' - 85.0' 2 1/4" TRI-CONE ROLLER ROCK BIT: 85.0' - 95.0' 2 7/8" (NX) CORE BARREL W/ DIAMOND BIT: 85.0' - 98.0'		
			10.0' ± TO 16.0' ± SILT: REDDISH BROWN; HARD; DRY; LIMY; GRAVELLY WITH FINE GRAVEL; CLAYEY			2. NOTE: NO OVER- BURDEN SAMPLES WERE RETAINED; NOTE: RECOVERED CORE WAS BOXED.		
	20		16.0' ± TO 47.0' ± SILTSTONE/SANDSTONE: BADLY WEATHERED; BROWN-REDDISH BROWN; SOFT-VERY SOFT; DRY; CALCAREOUS; WEAKLY CEMENTED; PREDOM- INANTLY FINE GRAINED; SLIGHTLY CONGLOMERATIC 20.0' ± - 26.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			3. BORING LOCATION: NOTE: BORING WAS LOCATED BY SWA.		
			30.0' ± - 35.0' ±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER			4. NOTE: TOP OF ROCK TAKEN AS TOP OF WELL DEFINED OLDER DIPPING BEDS		
	40					6 5/8" HOLLOW STEM FLIGHT AUGER		

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PROJECT
CUCHILLO NEGRO CREEK

HOLE NO
CN-CH-B

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 3 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinate & Station)				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-8				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		13. DISTURBED UNDISTURBED	
5. NAME OF DRILLER				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN				16. DATE HOLE		16. STARTED COMPLETED	
8. DEPTH DRILLED INTO ROCK				29 MAY '86		30 MAY '86	
9. TOTAL DEPTH OF HOLE				17. ELEVATION TOP OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	
				19. SIGNATURE OF INSPECTOR <i>Jackie R. Hobbs</i>		19.	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIAL (Description) d	% CORE RECOVER- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
			42.0'± - 47.0'±: SLIGHTLY MORE CEMENTED; WITH LESS SILT & CLAY BINDER	45.0			
			47.0'± to 97.5'± GRAVEL/CONGLOMERATE: L:3.5 FINE TO LARGE; ROUNDED- ANGULAR; DENSE; DRY; CALCAREOUS; IN A REDDISH BROWN, VERY SILTY BINDER; SLIGHTLY SANDY; WITH SOME WEAK CEMENTATION	50.0	Box #1	NOTE: LOST CORE FROM 45.8' - 49.3'	
						6 5/8" HOLLOW STEM FLIGHT AUGER	

ENG FORM 1836
MAR 71

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PROJECT: **CUCHILLO NEGRO CREEK** HOLE NO: **CN-CH-8**

DRILLING LOG		DIVISION		INSTALLATION		SHEET 3 OF 3 SHEETS	
1. PROJECT CUCHILLO NEGRO CREEK				10. SIZE AND TYPE OF BIT			
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (FSL or MSL)			
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL			
4. HOLE NO. (As shown on drawing title and site number) CN-CH-8				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED	
5. NAME OF DRILLER				14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER	
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED DEG. FROM VERT.				16. DATE HOLE STARTED COMPLETED 29 MAY 86 30 MAY 86		17. ELEVATION TOP OF HOLE	
7. THICKNESS OF OVERBURDEN				18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR <i>James R. Hobbs</i>	
8. DEPTH DRILLED INTO ROCK				20. TOTAL DEPTH OF HOLE			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
97.5				95.0		2 1/4" ROCKBIT REMOVED w/ 2 3/8" CORE BARREL	
98.0			97.5' ± TO 98.0' T.D. LIMESTONE: UNWEATHERED; LIGHT GREENISH GRAY; HARD - VERY HARD; DENSE; CRYSTALLINE T.D. 98.0'	1:1.0 98.0	Box #1	NOTE: LOST CORE FROM 96.5' - 97.5' NOTE: DETERMINATION OF DIP OF ROCK FROM CORE IS UNRELIABLE.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.
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PROJECT: CUCHILLO NEGRO CREEK HOLE NO: CN-CH-8

Hole No. CN-CH-9

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
PROJECT		SUD		Allog. Dist		OF 6 SHEETS	
1. PROJECT Cuchillo Negro Basin				10. SIZE AND TYPE OF BIT 1 1/2" Diamond Impregnated			
2. LOCATION (Coordinate or Station) N 20° 10' 42" E 657075				11. DATUM FOR ELEVATION SHOWN (FSM or MSL) Lillem Sea Level			
3. DRILLING AGENCY Albuquerque District, Civil & Engineering				12. MANUFACTURER'S DESIGNATION OF DRILL Mobile Drill B-61			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-9				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		UNDISTURBED 0	
5. NAME OF DRILLER F.R. Drilling				14. TOTAL NUMBER CORE BOXES 13		15. ELEVATION GROUND WATER	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE STARTED 12/5/86 COMPLETED 12/10/86		17. ELEVATION TOP OF HOLE 4721	
7. THICKNESS OF OVERBURDEN 4.8 ft				18. TOTAL CORE RECOVERY FOR BORING 97.4%			
8. DEPTH DRILLED INTO ROCK 121.2'				19. SIGNATURE OF INSPECTOR John L. Martin / WJ			
9. TOTAL DEPTH OF HOLE 126.0'							

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4721			Gravelly Sand with clay, trace cobbles and boulders, tan, low to medium plasticity, moist	Not Appl.	CN-CH-9	100% H ₂ O recovery Casing advanced to 61.8'
	4.8		Limestone, micritic, slightly fossiliferous, hard, dense, gray	Not Appl.	No Sample 4.8' to 6.5'	
			Calcite filled fracture @ 0°, 15°, 24°, 75° @ 8.8', 8.9', 9.5', 9.6', 9.7', 10.5' and one from 14.2' to 15.1'	100	Box 1	100% H ₂ O recovery RQD 92 excellent 2.4"/min. rate H ₂ O pressure tests @ 8': - Total H ₂ O used 16.643 - max. pressure 7psi - run time 11 min.
4711	10		Iron oxide filled fractures in anastomosing network from 10.7' to 12.1'	100		100% H ₂ O recovery RQD 100-excellent 2.1"/min. rate
	15		Calcite and clay/FeO filled fractures @ 5°, 14°, 28° @ 18.3', 19.4', 20.4', 20.6', 20.7', 20.8', 21.3', 21.5'		Box 2	
				86		100% H ₂ O recovery to 18.5'; lost all H ₂ O recovery @ 18.5' 2.2"/min. rate Rock chatter @ 19.0'
4701	20					

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MAR 71

(TRANSLUCENT)

B-70

PROJECT
Cuchillo NegroHOLE NO.
CN-CH-9

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4721 NVD		Hole .40.CN-4-9		
PROJECT Cuchillo Negro Dam		INSTALLATION 1164 Dist		SHEET 2 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			chert, microcrystalline, hard, black - occurs as concretion @ 22.6' to 22.8'		Box 2	
			Calcite filled fractures @ 10°, 30°, 33°, 60° @ 22.7', 23.2', 23.6', 23.8', 23.8' to 24.6'	95	Box 3	0% H ₂ O recovery RAD 71 fair 1.2"/min. rate
	25		Clay and iron oxide filled stylolites from 24.5' to 24.7' mud at 28.1', 31.8'			
			becomes more fossiliferous from 25.6' to 27.4'	90		0% H ₂ O recovery RAD 85 good 1.6"/min. rate
			Shale interval or void between 27.0' to 27.4' (fast drilling - no core recovery)			H ₂ O pressure test @ 25': - total H ₂ O used 15.4 ft - max. pressure 15 psi - run time 11 min.
4691	30		Calcite filled fractures @ 0°, 22°, 28°, 37°, 45°, 90° @ 25.1' to 22.6', 23.0' to 23.6', 27.7', 28.1', 28.3', 29.3', 29.5', 30.8', 31.2', 32.3', 32.7', 33.9', 34.0'	100		0% H ₂ O recovery RAD 97 excellent 2.1"/min. rate
					Box 4	
	34.3		Clayey limestone, micritic, fossiliferous, medium hard to hard, dense gray to red to buff/tan, mottled	98		0% H ₂ O recovery RAD 77 good 2.0"/min. rate
	35		Solution collapse breccia with clasts to 2 cm. clay matrix, red - from 35.6' to 36.1'			
			Calcite filled fractures @ 0°, 8°, 16°, 60° @ 35.9', 36.1', 36.3', 36.6', 36.9', 37.1', 37.4'	100		0% H ₂ O recovery RAD 66 fair 2.3"/min. rate
4681	40		becomes shaley (very clayey) from 40.7' to 41.2'			
			Calcite filled fractures @ 13°, 17°, 25° @ 39.0', 40.0', 40.1', 40.4', 41.5', 42.0', 42.5'		Box 5	
	43.9					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4721 NgyD		Hole No. CN-CH-9		
PROJECT Cuchillo Negro Site		INSTALLATION 4 1/2" Dst		SHEET 3 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4671	45		Shaley limestone, micritic, clayey, soft fissile, dense Calcite filled fractures Reduced & oxidized iron on parting surfaces	96	Box 5	0% H ₂ O recovery RAD 41 poor 2.1"/min. rate rod chatter @ 44.5'
	50		very clayey from 50.7' to 50.9'	98		0% H ₂ O recovery RAD 59 fair 2.5"/min. rate
	52.3		Clayey limestone, same as 44.3' to 43.9'		Box 6	H ₂ O pressure test @ 50': - Total H ₂ O used 17.6 ft ³ - Max. pressure 19 psi - Run time 12.0 min.
	55		becomes mottled @ 53.8' (bioturbated?) Calcite filled fractures @ 15°, 42°, 41°, 90° @ 54.7', 54.9', 55.7', 55.9', 56.5' to 57.4', 57.7', 58.0'	100		0% H ₂ O recovery RAD 79 good 3.5"/min. rate
4661	59.0		Limestone, same as 4.8' to 34.3', but olive tan to red	93		0% H ₂ O recovery RAD 66 fair 2.3"/min. rate
	60		Calcite filled fractures @ 7°, 22°, 35°, 60° @ 58.7', to 59.0', 60.1', 60.3', 60.5' highly fractured @ 61.8' to 62.3'		Box 7	
	62.5		Limestone breccia, clasts of limestone to 2 cm, clay matrix, soft, friable, tan			
	63.1		Limestone, same as 4.8' to 34.3'	98		0% H ₂ O recovery RAD 90 excellent 3.3"/min. rate
	65					

ENG FORM 1836-A

(REV 1110 1-1801)

GPO 1986 OF - 678 - 603

PROJECT

Cuchillo Negro

HOLE NO

CN-CH-9

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4721	Hole No. CN-CH-9		
PROJECT Cochillo Negro Site			INSTALLATION Albq Dist	SHEET 7 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4651	69.3		Clayey limestone, same as 34.3' to 43.9' Calcite filled fracture @ 31.0' & 70.6'	100	Box 7	0% H ₂ O recovery RAD 100 excellent 1.5"/min. rate
	70				Box 8	
	73.9		Limestone conglomerate, clasts to 1 cm, micritic matrix, fossiliferous, hard, dense, gray and red Limestone, micritic, fossil- iferous, hard, dense, gray Limestone conglomerate, clasts to > 5 cm, clayey limestone matrix with varying clay content, medium hard to hard, dense, gray and olive tan.	98		0% H ₂ O recovery RAD 71 fair 2.7"/min. rate
	74.9					
75.7						
4641	78.9		Limestone, same as 74.9' to 75.7' Calcite filled fracture @ 90° from 79.1' to 80.0'	97	Box 9	0% H ₂ O recovery RAD 61 fair 2.7"/min. rate
	80.2					
	81.6		Irregularly laminated micritic limestone (laminations spaced 1 cm to 2 cm) and soft cal- careous shale - some floating pieces of limestone			
			Clayey limestone, same as 34.3' to 43.9'			
4631	85		Fossiliferous interval @ 85.1' to 85.6'	100		0% H ₂ O recovery RAD 60 fair 2.1"/min. rate
	87.4					
			Limestone, same as 4.8' to 34.3' with chert concretions to 10 cm. many calcite filled fractures.		Box 10	0% H ₂ O recovery RAD 94 excellent 2.7"/min. rate
	90		becomes mottled @ 89.3' to 92.6'	100		

ENG FORM 1836-A

(EN 1110 1 1801)

GPO 1980 OF - 618 - 503

PROJECT

Cochillo Negro

HOLE NO

CN-CH-9

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-9		
PROJECT		INSTALLATION		SHEET 5		
Cuchillo Negro Site		Alb. Dist		OF 6 SHEETS		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	92.6		Clayey limestone, same as 34.3' to 43.9', not much clay, shaley interval @ 92.6' to 92.7'		Box 10	
	94.4		Limestone, micritic, fossiliferous, hard, dense, mottled grey and brown/red	98		0% H ₂ O recovery RQD 98 excellent 2.8"/min. rate
	95		Shaley intervals @ 95.9', 97.2'			
			Iron oxide filled fracture @ 90° from 96.7' to 98.0'		Box 11	
4621	100		slightly less fossiliferous from 100.1' to 104.6'	98		0% H ₂ O recovery RQD 91 excellent 2.15"/min. rate
			Calcite filled fractures @ 180°, 60° @ 100.4', and 100.9' to 101.5'			
	105		Calcite filled fractures @ 140°, 70° @ 105.1', 105.6', 106.1', 106.4'	90		0% H ₂ O recovery RQD 84 good 2.5"/min. rate
	108.5				Box 12	
	109.1		VOID VOID			
4611	110		limestone, same as 94.4' to 108.5'	100		0% H ₂ O recovery RQD 90 excellent 2.7"/min. rate
			Calcite filled fracture @ 90° from 110.0' to 111.2'			
	112.4		Limestone, same as 4.8' to 34.3', with chert concretion @ 114.0'			
	115					

ENG FORM 1836-A

(REV 1110 1 1801)

GPO 1980 OF - 625 - 603

PROJECT

Cuchillo Negro

HOLE NO

CN-CH-9

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE	Hole No.		
PROJECT			INSTALLATION	SHEET		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	116.7		Limestone, same as 80.2' to 81.6' shale intervals from 116.7 to 116.8' and 118.5' to 118.6'	100	Box 13	0% H ₂ O recovery RQD 87 good 2.3"/min. rate
	118.6		Limestone, same as 4.8' to 34.3'			
4601	120		Limestone, same as 94.4' to 108.5'	100		0% H ₂ O recovery RQD 43 poor 1.0"/min. rate
			Calcite filled fractures @ 60', 73' @ 120.3' to 120.8' and 123.0' to 123.4'	100		0% H ₂ O recovery RQD 92 excellent 3.2"/min. rate
	125		Shaley intervals at 123.5' to 123.6' and 125.0' to 125.1'			
4595	126		Stopped drilling @ 126'			Stopped drilling on 12/10/86

Hole No. CN-CH-10

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 5 SHEETS	
1. PROJECT Cuchillo Negro Dam		SWD		Alleg. Dist			
2. LOCATION (Coordinates or Station) N. 80° 66' 25" E. 65' 17.90				10. SIZE AND TYPE OF BIT NX Diamond Impregnated			
3. DRILLING AGENCY Albuquerque Dist. Corp of Engineers				11. DATUM FOR ELEVATION SHOWN (FSM or MSL) Mean Sea Level			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-10				12. MANUFACTURER'S DESIGNATION OF DRILL Mobile Drill B-61			
5. NAME OF DRILLER P.K. Drilling				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				14. TOTAL NUMBER CORE BOXES 7		UNDISTURBED 0	
7. THICKNESS OF OVERBURDEN 13.0'				15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK 21.8'				16. DATE HOLE STARTED 12/2/86 COMPLETED 12/5/86			
9. TOTAL DEPTH OF HOLE 79.8'				17. ELEVATION TOP OF HOLE 4665			
				18. TOTAL CORE RECOVERY FOR BORING 80.9%		5	
				19. SIGNATURE OF INSPECTOR John A. Lewis / WTI			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4665			Poorly Graded Gravel, With sand, some cobbles, trace boulders, light brown, no plasticity, moist		CN-CH-10	Started drilling 12/2/86 70% - 100% H ₂ O recovery to 19.8' Casing advanced to 19.8'	
4655	10						
	15						
	20						
4645	19.8		Limestone, micritic, hard, dense, sparse fossils, gray to red to tan	Not Appl	110 Sample 18.0' - 19.8'		

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B-76

PROJECT Cuchillo Negro

HOLE NO. CN-CH-10

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4665 NGVD		Hole No. CN-CH-10		
PROJECT Cuchillo Negro Site		INSTALLATION A/6 Dist		SHEET 2 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Caliche fillback fractures @ 0°, 22°, 48° @ 22.1', 22.5', 23.2'	100	Box 1	50% H ₂ O recovery RAD 96 excellent 2.1"/min. rate
	24.1		Shale, limestone micritic to fine grained, soft, friable, red to buff, iron-oxide rusting on fracture surfaces	91		H ₂ O pressure test @ 23': - 16.4 ft ³ H ₂ O used - 17 psi max H ₂ O press. - 11 min run time
	24.7		Arkosic Sandstone, fine grained, angular to subround grains, poorly cemented, soft, friable, qtz, K-spar (to clay), SiO ₂ cement & clay matrix			50%-70% H ₂ O recovery RAD 30 poor 3.8"/min rate
	27.0		Shale, clayey, soft, crumbly, non-calcareous, tan to pink			
	27.6		Arkosic, same as 24.7-27.0'			
	28.0		Chert, microcrystalline, hard, blocky fragments, black			
4635	28.6		Limestone, same as 19.8' to 24.1' with highly fossiliferous lenses @ 28.6'	100		70% H ₂ O recovery RAD 75 good 2.3"/min. rate
	30.8		Shale, same as 27.0' to 27.6'		Box 2	
	31.4		Conglomerate, clay matrix with clasts to 2 cm, soft, friable, clasts of shale, chert, limestone			
	32.1		Limestone, micritic, fossiliferous, hard dense, gray			
	32.8		Shale, same as 27.0' to 27.6' but purple			
	33.8		Chert (silicified limestone), microcrystalline, hard, 10% porosity, porosity due to leached fossils, tan	54		75% H ₂ O recovery RAD 18 very poor 6.3"/min. rate
	34.4		Limestone, same as 19.8' to 24.1' but with some clay, moderately hard			
	35.4		Calcareous shale, soft, friable, pink			
			Shale, same as 27.0' to 27.6'			
			becomes sandy at 37.0'			
4625	40			43		80% H ₂ O recovery RAD 0 very poor 5.3"/min. rate

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No.	
PROJECT		INSTALLATION		SHEET 3 OF 5 SHEETS	
Cuchillo Negro Dam		4665 N6VD		CN-CH-10	
ELEVATION		DEPTH		LEGEND	
CLASSIFICATION OF MATERIALS (Description)		% CORE RECOVERY		BOX OR SAMPLE NO	
REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)					
4615	46			Box 2	90% H ₂ O recovery RAD 0 very poor 11"/min. rate
	47.8		80		
	49.7	Manganese Ore (concentrate) soft, friable, black, fast drilling.			
	50	Conglomerate, same as 31.4' to 32.1'			
	50.6	Arkose, same as 24.7 to 27.0			
	52.7	Shale, same as 27.0 to 27.6' with chert clasts to 1.5 cm between 50.7' and 60.0'	64	Box 3	80% H ₂ O recovery 1st H ₂ O recovery between 53.1' to 54.8' 90% H ₂ O recovery to 55.6' RAD 40 poor 3.2"/min. rate
	53.2	Limestone, same as 32.8' to 33.8'			
	55				
	56.7	Calcareous shale, same as 55.4' to 56.0', bot rust and tan	70		30% H ₂ O recovery RAD 68 fair 1.8"/min. rate slow rate due to core barrel blockage. H ₂ O pressure test @ 58' - 16.4 ft ³ H ₂ O used - 17 psi max pressure - 11 min. run time
	57.5	Limestone, same as 19.8' to 24.1'			
		Calcite filled fracture @ 90° from 60.2' to 61.0'			
4605	60	Iron Oxide filled fracture @ 90° @ 61.5'			
	61.9		79		0% H ₂ O recovery RAD 48 poor 1.9"/min. rate
	62.7	Arkose, same as 24.7 to 27.0', cemented with dolomite			
		Limestone, same as 19.8' to 24.1'			
		Calcite filled fracture @ 75° from 65.3' to 65.9'			
	65	1-2 mm thick clay partings @ 66.7', 67.0', 67.9'		Box 4	
		Highly fossiliferous from 67.1' to 67.5'	93		0% H ₂ O recovery RAD 88 good 1.2"/min. rate

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-10		
PROJECT Cuchillo Negro Site		INSTALLATION 4665 N6VD		SHEET 4 OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4595	68.3		Limestone, highly fossiliferous with shale and chert clasts, micritic matrix, hard, dense, gray and red		Box 4	
	70		Limestone, same as 32.1' to 32.8' but tan and rust calcite filled fractures @ 20, 68' to 69.9' to 70.8', 71.0'	36		0% H ₂ O recovery RQD 11 very poor 2.7"/min. rate Drill string chatter started @ 73.0'
	71.9		Shale, limestone, same as 24.1' to 24.7'			
	72.5		Limestone breccia, clay matrix, clasts to 3 cm, soft, poorly indurated, tan to pinkish, very poor core recovery			
	75					
4585	76.1		Chert, same as 33.8' to 34.4', becoming very porous (30%+ porosity) from 76.7' to 77.1'	46		0% H ₂ O recovery RQD 77 good 1.3"/min rate
	77.1		Chert, same as 28.0' to 28.6'		Box 5	Slow rate due to drill string chatter
	77.7		Limestone, same as 32.1' to 32.8'			
	80		Calcite filled fracture @ 83' from 78.7' to 79.3'			
			Chert concretions @ 81.3', 81.5', 82.3'	78		0% H ₂ O Recovery RQD 85 good 2.2"/min rate drill string chatter
4575			Clay partings @ 1 cm to 5 cm spacing from 86.0' to 89.3', and @ 90.0', 90.3', 91.3', 91.9', 92.2', 92.5', 92.7'			
	85			48	Box 6	0% H ₂ O recovery RQD 86 Fair 1.4"/min rate drill string chatter
	90		chert layer, 1 cm thick @ 91.6'	45		0% H ₂ O recovery RQD 37 Poor 1.5"/min. rate drill string chatter

DNG FORM 1836-A

(SR 1110 1 1801)

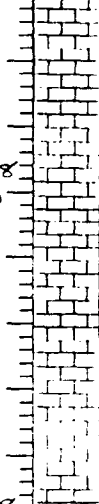
GPO 1960 OF - 679 - 609

PROJECT

Cuchillo Negro

HOLE NO

CN-CH-10

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4665 NGVD		Hole No. CN-CH-10	
PROJECT Cuchillo Negro Site			INSTALLATION Alber Dist		SHEET 5 OF 5 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	74.8 95		Limestone, same as 19.8' to 24.1', with clay partings spaced 0.1' to 0.5' from 95.2' to 99.5'	98	Box 6	0% H ₂ O recovery RQD 52 fair 2.3"/min. rate
4564.2	99.8 100		Stopped drilling @ 99.8'			Stopped drilling on 12/4/86

Hole No. CN-CH-11

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		SVD		Algs. Dist		1 OF 6 SHEETS	
2. LOCATION (Coordinates or Station)		Cuchillo Negro Dam		10. SIZE AND TYPE OF BIT NX diamond		imprestated	
3. DRILLING AGENCY		Albuquerque District, Corp of Engineers		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		NGVD	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-11		12. MANUFACTURER'S DESIGNATION OF DRILL		Mobile Drill B-61	
5. NAME OF DRILLER		P.R. Drilling		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 1 UNDISTURBED 0	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		14. TOTAL NUMBER CORE BOXES		12	
7. THICKNESS OF OVERBURDEN		4.5 ft		15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK		121.5 feet		16. DATE HOLE		STARTED 11/11/86 COMPLETED 11/20/86	
9. TOTAL DEPTH OF HOLE		126.0 feet		17. ELEVATION TOP OF HOLE		47.66'	
				18. TOTAL CORE RECOVERY FOR BORING		88.5%	
				19. SIGNATURE OF INSPECTOR		John J. Davis	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
47.66			CLAYEY SAND, with gravel (SC), light brown, low plasticity, loose, moist	Not Appl.	CN-CH-11-01-4.5	Start drilling on 11/11/86 100% H ₂ O recovery; 1.5"/min, 1 grab sample	
45.5	5		Limestone, micritic, fossiliferous with detrital carbonate particles, gray, hard dense, CaCO ₃ filled fractures @ 5°, 22°, 50°, 90° @ 5.0', 5.5'	58	Box 1	100% H ₂ O recovery; 1.3"/min rate RQD 48 poor	
			No Sample		No Sample	Driller advanced casing to 11'. No coring attempted between 5.5' and 11.0'	
46.76	10		Limestone, micritic, slightly fossiliferous, mottled gray and rust, hard, dense, massive, CaCO ₃ filled fractures @ 5°, 22°, 50°, 90° @ 11.3', 11.7', 12.0', 12.1', 13.5', 13.8', 13.9', 14.4', 15.2', 16.1', 17.7'	100	Box 1	100% H ₂ O recovery; 3.8"/min rate RQD 93 excellent	
	15					H ₂ O pressure test @ 12.0': 11 min. test 12.24 ft ³ 8 psi max pressure	
44.86	19.5		Calcareous shale, very fine grained, ochre to rust soft, with limestone interval @ 20.0' to 20.4' and 20.6' to 20.9'	62		100% H ₂ O recovery to 19.0'. Lost recovery @ 19.0' and partially regained and lost H ₂ O recovery over several intervals to 21.0'	

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B-81

PROJECT Cuchillo Negro Dam

HOLE NO. CN-CH-11

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE	Hole No. CN-CH-11		
PROJECT			4706 N6VD	SHEET 2 OF 6 SHEETS		
Cuchillo Negro Dam			Alber Dist			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant) g
	42.5		Calcareous shale, same as 17.5' to 20.8'	92	Box 4	0% H ₂ O recovery RAD 83 good 1.6"/min. rate
	43.6		Limestone, same as 39.5' to 42.0'; calcite and iron oxide filled fractures @ 60° & 23° @ 43.3' and 43.4'			
	45		Limestone, same as 11.0' to 17.5'. Calcite and iron oxide filled & fractures @ 30° & 45° @ 43.7', 44.1', 44.2', 44.3', 44.7', 44.8', 44.9', 45.4'. Highly fossiliferous shaley interval @ 45.5' to 45.7'	100		
4656	49.5		Calcareous shale, same as 17.5' to 20.8'		Box 5	H ₂ O pressure test @ 50.0': 11 min. test 16.23 ft. ³ 14 PSI max. pressure
	50		Limestone, same as 11.0' to 17.5'. Calcite filled fractures @ 0°, 5°, 70°, 90° @ 50.4', 51.3', 51.5', 51.7', 52.4', 52.5', 52.6', 52.8', 54.0', 55.5', 56.6', 57.1', 57.2', 57.3'. Extreme fracturing @ 50.5' to 51.0' & 55.5' to 55.8'. Calcareous shale interval 54.5' to 54.7'. 2 calcite filled fractures extending from 51.0' to 52.7' and 53.0' to 54.0'	97		0% H ₂ O recovery RAD 91 excellent 1.7"/min. rate
	55					
	60			98	Box 6	0% H ₂ O recovery RAD 97 excellent 1.8"/min. rate
4646	61.2		Clayey limestone, micritic, slightly fossiliferous, tan, Red, pink, dense, moderately hard			0% H ₂ O recovery RAD 53 fair 1.7"/min. rate
	62.1		Limestone, same as 11.0' to 17.5', Calcite filled fractures @ 5° & 25° @ 63.0', 63.1', 63.3', 63.4', 63.5', 63.7', 63.9'	84		
	64.5					
	65					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 4706 NGVD		Hole No. CN-CH-11			
PROJECT Cuchillo Negro Dam		INSTALLATION ALBO DIST.		SHEET 4 OF 6 SHEETS			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
4636	64.5		Shaley limestone, same as 25.1' to 26.1', soft, with highly fractured intervals @ 64.5' to 65.6' and 66' to 67.5' becomes dolomitic at 67.0' and appears to be H ₂ O saturated @ 64.5' to 67.5'		Box 6	hole caving started at this interval (65' ± 2') Poor core recovery, mostly just fragments 0% H ₂ O recovery RQD 36 poor 2.5"/min. rate	
	65						
	70		Limestone, same as 11.0' to 17.5' with highly fossiliferous porous interval from 71' to 71.6' (similar to 21.8' to 22.6'), highly fossiliferous intervals @ 71.7', 72.0' Iron oxide filled fractures @ 10' @ 70.7', 70.9', 71.6', 71.9', 72.0'	45		0% H ₂ O Recovery RQD 86 good 2.7"/min rate	
	70.4						
	74.1		Limestone, micritic to coarse grained, fossiliferous, hard to soft and competent to friable with death, pink, appears to be calcine in origin micaceous shale, same as 17.5' to 20.8'	89	Box 7	0% H ₂ O Recovery RQD 86 good 2.7"/min rate	
	75						
	75.4						
	76.0						
4626			Limestone, same as 11.0' to 17.5', with shaley interval @ 79.8' to 80.2' and iron oxide nodules (2 mm Ø) @ 80.4'			0% H ₂ O recovery RQD 83 good 2.0"/min. rate	
	80		along Calcite filled fractures @ 90' from 77.2' to 78.1' and 78.3' to 79.3'	91		0% H ₂ O recovery RQD 99 excellent 2.7"/min rate	
			becomes more fossiliferous below 85.0' Shaley, micritic basinal layer 1" thick @ 85.3' Highly fossiliferous and dense to 92.8'		Box 8	0% H ₂ O recovery RQD 99 excellent 2.7"/min rate	
	85			100			

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CA-CH-11		
PROJECT		INSTALLATION		SHEET		
Cuchillo Negro Dam		4680 DIST		5 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant.) g
4616	90		Calcite filled fractures @ 23' & 89.9', 91.6' 73° fractures @ 91.3', 91.4', 91.6', 91.7'	94	Box 8	0% H ₂ O recovery RQD 94 excellent 2.6"/min rate
			Becomes slightly fossiliferous @ 92.8'	100	Box 9	0% H ₂ O recovery RQD 100 excellent 2.6"/min. rate
	95		sparse fossils below 96.0'			
4606	100		Clay partings @ 17° @ 97.3', 97.6', 98.6', 99.5', 100.0', 100.4', 100.7', 101.0', 101.2', 101.5', 101.8', 102.3', 102.7', 102.9', 103.1', 103.3', 103.5', 103.7', 104.0', 104.2', 104.8' with some calcite within the partings	96		0% H ₂ O recovery RQD 75 fair/good 2.3"/min. rate
	105		Buff to rust color between 104.3' and 104.9'	99	Box 10	0% H ₂ O recovery RQD 78 good 2.9"/min. rate
				47		0% H ₂ O recovery RQD 26 poor 2.1"/min. rate Rock chattering below 108.0'
4596	110		Fault gouge & Breccia - starts as highly fractured limestone with quartz and calcite veins → goes to very soft, manganese ore; (concentrate) black, shaley → goes to more competent black shale with sporadic quartz cementation and quartz & calcite veins → goes to highly fractured limestone as above			soft black organic shaley material may be dissolution residue note: slickensides on quartz cemented shaley material

ENG FORM 1836-A (REV 1110 1-1801)

GPO 1980 OF - 620-005

PROJECT CUCHILLO NEGRO

HOLE NO CA-CH-11

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No.		
PROJECT		INSTALLATION		SHEET		
Cuchillo Negro Dam		ALBO DIST		N-CH-11		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	112.1		Fault gouge & Breccia			
	115		Limestone, same as 11.0' to 17.5' with shaley limestone interval @ 114.9' to 115.0'	93	Box 11	0% H ₂ O recovery RQD 80 good 1.9"/min. rate
	116.6		Clayey limestone, same as 61.2' to 62.1' (very poor core recovery)	77		0% H ₂ O Recovery RQD 55 fair 1.5"/min. rate
	118.3		Limestone, same as 11.0' to 17.5'			
4586	120		large 90° quartz and calcite filled fracture extending from 118.9' to 122.2'			
			Shaley interval from 123.8' to 124.5' (poor core recovery)	88		0% H ₂ O Recovery RQD 81 good 2.6"/min. rate
			Calcite filled fractures @ 25°, 35°, 60°, 90° @ 122.1', 122.2', 122.8', 123.3', 125.0'			
4580	125					
	126.0		Stopped drilling at 126.0'		Box 12	Stopped on 11/20/86

Hole No. CN-CH-12

DRILLING LOG		DIVISION SWD	INSTALLATION ALBO DIST	SHEET 1 OF 5 SHEETS
1. PROJECT Cuchillo Negro Dam		10. SIZE AND TYPE OF BIT NX Diamond Impregnated		
2. LOCATION (Coordinates or Station) N 80° 44' 22" E 1.657890		11. DATUM FOR ELEVATION SHOWN (FWS = MSL) NGVD		
3. DRILLING AGENCY Hibernique Dist. Corp of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL Mobile Drill B-61		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-12		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN DISTURBED UNDISTURBED		
5. NAME OF DRILLER P.R. Drilling		14. TOTAL NUMBER CORE BOXES 9		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 4.8 ft.		16. DATE MOLE STARTED 11/24/86 COMPLETED 12/1/86		
8. DEPTH DRILLED INTO ROCK 95.6		17. ELEVATION TOP OF HOLE 4662		
9. TOTAL DEPTH OF HOLE 100.4'		18. TOTAL CORE RECOVERY FOR BORING 81.4%		
		19. SIGNATURE OF INSPECTOR John S. Davis/wt		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
4662			Poorly Graded Gravel with sand (GP), some cobbles, trace boulders, light brown, loose, no plasticity, moist	Not Appl.	CN-CH-12 0'-4.8'	Start drilling on 11/24/86 100% H ₂ O recovery, 1.9"/min rate, 1 grab sample
	4.8		Limestone, medium grained, gray, hard, dense, massive. Calcite filled fractures @ 33° & 85° @ 6.0', 6.3', 6.4', 6.9', 7.1', 7.5', 7.9'	Not Appl.	Not Appl.	70-80% H ₂ O recovery except for 0.9' between 8.0' to 8.5' & 9.0' to 9.3'
	8.0		Limestone, micritic, fossiliferous, mottled rust gray, hard, dense	63	Box 1	RQD 28 poor 3.2"/min. rate
	8.4		Shaley limestone, micritic to fine grained, fossiliferous, with secondary calcite, soft, incompetent, some clay			H ₂ O pressure test @ 6': 11.0 ft ³ H ₂ O; test time 11 min Max H ₂ O pressure 7 psi
4652	10		This material is - extremely fragmented	44		100% H ₂ O recovery RQD 22 poor 6.6"/min. rate due to extremely fragmented nature of material a representative sample was taken
	14.0		Limestone, same as 4.8' to 8.0'			
	15		Shaley limestone, same as 8.4' to 14.0'			
	16.0		Limestone, micritic, fossiliferous, reddish to gray, hard, dense, Shaley intervals @ 17.7'-19.8', 18.3' to 18.4'	82		100% H ₂ O recovery RQD 70 fair 3.9"/min. rate
			Calcite filled fracture @ 70° from 16.1' to 17.1'			
			Pyrite @ 19'			H ₂ O pressure test @ 20': 19.2 ft ³ H ₂ O, test time 11 min Max H ₂ O pressure 12 psi
4642	20					

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MAR 71

(TRANSLUCENT)

PROJECT
Cuchillo ALBOHOLE NO.
CN-CH-12

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-12		
PROJECT		INSTALLATION		SHEET		
Cuchillo Negro Dam		ALBO DIST		OF 5 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
4632	21.0	+	Calcareous shale, fossiliferous, buff to tan to rust, soft, moderately dense	100	Box 2	100% H ₂ O recovery RQD 92 excellent 5"/min. rate
	22.5	+	Limestone, same as 16.0' to 22.0'			
	25.2	+	Pyrite @ 21.6', shaley interval @ 22.3' to 22.5'			
	26.3	+	Limestone, micritic, sparse fossils, gray, hard, dense, massive, shaley interval @ 24.4' to 24.7'	77		100% H ₂ O recovery except 0% between 27.4' to 27.8', RQD 68 fair
	26.3	+	Shaley limestone, same as 8.4' to 14.0' except moderately hard			
	30	+	Limestone, same as 22.5' to 25.2', shaley interval @ 27.0' to 27.2' and slightly shaley/clayey interval @ 28.3' to 28.9', calcite filled fractures @ 24°, 40°, 90° @ 28.9', 29.5', 29.9', 30.0'			
	30	+	Calcareous shale, same as 20.0' to 21.0'	100	Box 3	100% H ₂ O recovery RQD 57 2.9"/min. rate
	34.7	+	Moderately indurated @ 33.0' to 33.8'			
	35	+	Common unfilled fractures parallel to layering			
	4622	35.6	+	Shaley limestone, same as 8.4' to 14.0', but harder and slightly porous	94	
36.1		+	Limestone conglomerate, clasts to 3 cm, micritic, hard, dense, gray to rust to buff with 90° fracture from 35.0' to 37.0'			
37.2		+	Shaley limestone, same as 8.4' to 14.0' but better cemented, calcite filled fractures @ 13° @ 36.2', 36.4', 36.5', 36.7'			
40		+	Limestone, same as 22.5' to 25.2'	100	Box 4	100% H ₂ O recovery RQD 100 excellent 5.0"/min rate This run produced a single, unbroken length of core 5.1' long.
40		+	Calcite filled fractures @ 0°, 7°, 10°, 32°, 43°, 90° @ 30.8', 38.9', 39.0', 39.4', 39.8', 40.0', 40.7', 41.3', 43.8', 43.9', 44.0', 44.3', 44.5', 44.8'			
40		+	Irregular Iron Oxide filled fractures between 38.5' to 39.2'			

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. (N-4-12)	
PROJECT			INSTALLATION		SHEET 3 OF 5 SHEETS	
Cuchillo Negro Dam			ACBQ DIST			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	45		Limestone, same as 22.5' to 25.2'			
	47.1		Shaley limestone, same as 8.4' to 14.0', with some clay	75		0% H ₂ O recovery 46.4' to 47.0'; 50% from 47.0' to 50.0'; 0% from 50.0' to 50.4'; 10-15% from 60.4' to 61.4'
	48.2		Limestone, same as 22.5' to 25.2'			RQD 53 Fair
	49.0		Chert, microcrystalline, very hard, dark brown to black, blocky fragments			3.6"/min rate
4612	50		Limestone, same as 22.5' to 25.2'			Chert interval caving badly
	50.3					H ₂ O pressure test @ 50': 19.7 ft H ₂ O; max press. 15 psi test time 11 min
	51.4		Calcareous shale, same as 20.0' to 21.0', very soft and clayey, contains black organic (?) material	42	Box 5	0% H ₂ O recovery from 51.4' to 52.0'; 10% from 52.0' to 53.0'; 0% from 53.0' to 54.2'; 15% to 54.2' from 54.2' to 55.8'; 0% from 55.8' to 58.0'
	54.2		Limestone, same as 22.5' to 25.2'			RQD 19 very poor
	55					9.1"/min. rate
	55.3		Calcareous shale, same as 21.0' to 22.0'			
	55.8		VOID VOID			Drill string dropped freely from 55.8' to 58.0', lost H ₂ O circulation @ 55.8'
	58.0		Limestone, same as 4.8' to 8.0' but buff to light gray	97		0% H ₂ O recovery
	58.5		Limestone, same as 22.5' to 25.2' but with tan to reddish intervals			RQD 97 excellent
4602	60		calcite filled fractures @ 0°, 4°, 50°, 79°, 90° @ 58.0', 59.1', 60.3', 60.4', 62.3', 62.6', 62.9', 63.2' and one large fracture extending from 59.3' to 62.2'			1.8"/min
	63.9		Limestone, same as 6.0' to 20.0' with tan shaley/clayey intervals @ 64.1' to 64.3' and 65.4' to 65.8'	55	Box 6	0% H ₂ O recovery
	65					RQD 42 poor
	65.9		Calcareous shale, same as 21.0' to 22.0'			5.7"/min. rate
			very poor core recovery			

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No.		
PROJECT		INSTALLATION		SHEET		
Cuchillo Negro		ALBQ DIST		4 OF 5 SHEETS		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV. ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	68.7				Box 6	
	69.0		Shaley limestone, same as 8.4' to 14.0'	35		0% H ₂ O recovery
	69.7		Limestone, same as 22.5' to 25.2'			RQD is very poor
4592	70		Shaley limestone, same as 8.4' to 14.0' grading into calcareous shale with angular clasts of shaley limestone @ 70.5' (appears to be brecciated limestone w/ clayey matrix)			10.8"/min. rate
	73.8		Very poor core recovery	85		much of the clay was washed out during drilling
	74.9		Chert, same as 49.0' to 50.3' with minor porosity, partially filled with zeolites			0% H ₂ O recovery
	75		Calcareous shale, same as 20.6' to 21.0'			RQD 58 fair
	75.5		Limestone, same as 22.5' to 25.2'			3.3"/min. Rate
	78.0		Calcite filled fracture @ 45' & 75.9'			
	80		Shaley limestone, same as 8.4' to 14.0' contains some clay	100	Box 7	0% H ₂ O recovery
4582	83.1		Limestone, same as 22.5' to 25.2', Calcite filled fractures @ 75' @ 83.1' and 83.3'	100		RQD 66 fair
	84.5		Limestone conglomerate, micrite matrix, calcareous shale clasts to 1cm, soft to hard, dense, red to tan to gray			2.0"/min. rate
	85		Limestone, same as 22.5' to 25.2'			
	85.3		becomes reddish and shaley (hard) @ 91.5' to 92.5'			
	90		Calcite filled fractures @ 15', 68', 90', @ 91.0', 91.1', 91.4', 91.8'	100	Box 8	0% H ₂ O recovery
4572						RQD 90 excellent
						2.3"/min. rate

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		4662 N6VD		Hole No. CN-CH-12	
PROJECT			Cuchillo Negro Dam			INSTALLATION	
			ACBO DIST			SHEET 5 OF 5 SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
	93.2		Limestone, same as 16.0' to 20.0' with 5% to 10% porosity, highly fossiliferous, with sparsely fossiliferous intervals @ 93.6' to 93.8' & 94.1' to 94.6'.	97	Box 8	0% H ₂ O recovery RQD 79 good 1.3"/min. rate Slow drilling due to drill rod chatter	
	95		Calcite filled fractures @ 96' & 75' @ 93.9', 94.0'				
	96.3		Limestone, micritic to fine grained, soft dense, reddish - possibly a coralline	100		0% H ₂ O recovery RQD 61 fair 1.2"/min. rate Slow drilling due to drill rod chatter	
	97.0		Limestone, micritic, clayey, moderately hard, dense, black to gray, sparse fossils				
			Calcite filled fractures @ 15', 21', 23' @ 97.6', 97.6', 97.7', every 1 cm from 97.8' to 98.5'		Box 9		
4561.6	100 100.4		Stopped drilling @ 100.4'			Stopped drilling on 12/1/86	

DRILLING LOG			DIVISION		INSTALLATION		SHEET	
			S.W.D.		ALB. DIST.		1	
PROJECT					HQ WIRELINE		OF 4	
CUCHILLO NEGRO CREEK DAM					N.G.V.D.			
LOCATION (Coordinates or Station)								
N 807.225; E 658.352								
DRILLING AGENCY			MOBILE DISTRICT		FAILING 314			
HOLE NO. (As shown on drawing BLS and file number)			CN-CH-15					
NAME OF DRILLER			J. TRIMM					
DIRECTION OF HOLE								
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.								
THICKNESS OF OVERBURDEN			31.2					
DEPTH DRILLED INTO ROCK			50.0					
TOTAL DEPTH OF HOLE			81.2					
					John C. Shaw			
ELEVATION	DEPTH	LOGGED	CLASSIFICATION OF MATERIALS (Description)	1 CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)		
	2		Alluvium, Sand, Gravel, & Boulders	Rockbitted (5 1/2')	No Sample	Rockbitted to top of rock. Set 6' casing to 19' set 4' casing to 31.3' Mixed bentonite mud.		
	3							
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END FORM 1836
MAR 71

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CUCHILLO NEGRO CREEK DAM CN-CH-15

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4614.6		Hole No. CN-CH-15	
PROJECT CUCHILLO NEGRO CREEK DAM			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 2 OF 4 SHEETS	
ELEVATION •	DEPTH •	LEGEND •	CLASSIFICATION OF MATERIALS (Description)	LOGS RECORDED •	BOXES SAMPLED NO.	REMARKS (Dip, time, water loss, depth of penetration, etc., if significant)
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32			Top of Rock			Began Coring w/ HQ
33			Limestone, hdy. sl. wea. to unwea. f. xln. w/ occ. bdd. ptgs. & h/a Pinkish Gray Dip: 15 - 20 Deg.			P-1 Run 9.3 Rec. 9.3 Loss 0.0 UL 0.0 Drill Fluid: H2O D.V.R. Action Smooth R.D.D. = 96% Excellent Drilling times not recorded by driller
34			Bdd. Ptg. tl. st. 15-20 deg.		Box 1 of 5	
35			Bdd. Ptg. op. st. 15-20 deg.			
36			2 Bdd. Ptg. tl. st. 15-20 deg.			
37			HB	100		
38			HB			
39			Bdd. Ptg. op. st. 15 deg.			
40			Bdd. Ptg. op. st. 15 deg.			
41			Jt. cal. Hd. 70 deg.			
42			Bdd. Ptg. tl. 15-20 deg.			
43			HB			
44			HB			
45			Bdd. Ptg. tl. 15-20 deg.		Box 2	
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100						

END FORM 1036-A (REV 11-10-1-1001) CUCHILLO NEGRO CREEK DAM CN-CH-15

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-15	
PROJECT			INSTALLATION		SHEET	
CUCHILLO NEGRO CREEK DAM			ALBUQUERQUE DISTRICT		3	
OF 4 SHEETS						
ELEVATION	DEPTH	LOGGED	CLASSIFICATION OF MATERIALS (Description)	± CORE RECOVERY %	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if applicable)
						P-2
			HB Cal. hld. lt. 70 deg.			Ran 9.9
			Bdd. Ptg. w/ red clay filler (1/2")			Rec. 9.7
						Loss 0.2
						V.L. 0.2
						Drill Fluid: H2O
						D.V.R.
						Act.: Smooth
						R.Q.D. = 97%
						Excellent
45				98	Box	
46			Limestone, mod. hd. to hd. unwea. w/ num. irr. argillaceous pkts. & lenses. Gray w/ occ. brick red pkts. Dip: irr. bdd. Low angle		2	
47					of	
48			HB Bdd. Ptg. tl. irr. 15 deg.		5	
49						
50			HB Irr. frac. op. hor.			
51						CD = 50.4 50.4
52			HB Intensely frac.			P-3
53			HB Bdd. Ptg. tl. st. irr. hor.			Ran 10.2
54						Rec. 10.2
55			Jt. op. sl. wea. st. cal. 60 - 65 deg		100	Loss 0.0
56			HB Bdd. Ptg. tl. irr. L/a		Box	U.L. 0.0
57			HB		3	Drill Fluid: "Liquid Mud"
58					of	Partial Mud Loss
59			HB		5	Act.: Smooth
60			HB Shaly			R.Q.D. = 89%, Good
61						CD = 60.6 60.6
62			Limestone, mod. hd. sl. to mod. wea. hl. frac. along open bdd. w/ cal. hld. frags. & v. soft clay seams. Pinkish Gray to Tan			P-4
63			Clay Seams, v. soft, red br.			Ran 10.0
64						Rec. 9.9
65			Limestone, hd. to v. hd. unwea. f. xln. w/ occ. cal. hld. jts. occ. fos.	99	Box	Loss 0.1
66			HB Gray Dip: 10-15 deg.		4	U.L. 0.1
67			HB		of	Drill Fluid: "Liquid Mud"
			HB		5	Partial mud loss
						Act.: Smooth
						R.Q.D. = 68%, Fair

SDO FORM 1836-A

(SR 1110-1-1801)

SPR 1000 07-000-000

CUCHILLO NEGRO CREEK DAM CN-CH-15

DRILLING LOG (Cont. Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-15	
PROJECT			INSTALLATION		SHEET	
CUCHILLO NEGRO CREEK DAM			ALBUQUERQUE DISTRICT		OF 4 SHEETS	
ELEVATION	DEPTH	LOGGED	CLASSIFICATION OF MATERIALS (Description)	NO. OF CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of penetration, etc., if significant)
69			Limestone (cont.) Bdd. Ptg. tl. st. 10-15 deg.			
			Cal. hld. jt. vuggy, 65 deg.			
70			H. frac. along cal. hld. jt. st. wea.			
71					Box 4 of 5	CD = 70.6 70.6
72			2 Bdd. Ptg. op. 0-5 deg.			P-5 Ran 5.4 Rec. 5.4 Loss 0.0 U.L. 0.0 Fluid: "Liquid Mud" Partial Mud Loss Act.: Smooth R.Q.D. = 94% Excellent
73			Bdd. Ptg. tl. 10 deg.	100		
74			HB			
75			HB			
76						CD = 76.0 76.0
77			Calcareous Shale, mod. hd. unwea. w/ occ. h/a cal. hld. jts. & occ. tight bdd. ptgs. Dip: 20 deg. Reddish Brown to Gray		Box 5 of 5	P-6 Ran 5.2 Rec. 5.2 Loss 0.0 U.L. 0.0 Fluid: "Liquid Mud" Partial Mud Loss Act.: Smooth R.Q.D. = 77% Good
78			Dark Gray to Black Shale			
79				100		
80			Bdd. Ptg.			
81			BDH			CD = 81.2 81.2
82		①	Pressure Tests (Single Packer) Test interval: d 34.1 - 81.2 (BDH) H2O press: 14 psi Gage press: 0 psi Take: 50 gal/5 min.			
83		②	Test interval: d 54.1 - 81.2 H2O press: 23 psi Gage press: 0 psi Take: 44 gal/5 min.			
84		③	Test interval: d 73.8 - 81.2 H2O press: 32 psi Gage press: 10 psi Total press: 42 psi Take: 9.5 gal/5 min.			
85						
86						
87						
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89						
90						
91						

ENG FORM 1336-A

(REV 1110-1-1001)

OPS 1022 07-022-020

CUCHILLO NEGRO CREEK DAM CN-CH-15

Hole No. CN-CH-16

DRILLING LOG		DIVISION		INSTALLATION		SHEET 1 OF 6 SHEETS	
1. PROJECT Cuchillo Negro Creek Dam		Southwest Div.		Albuquerque Dist.			
2. LOCATION (Coordinates of Station)				10. SIZE AND TYPE OF BIT HQ wireline			
3. DRILLING AGENCY Mobile District				11. DATUM FOR ELEVATION SHOWN (FTH or MSL) NGVD			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-16				12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314			
5. NAME OF DRILLER J. Trimm				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DES. FROM VERT.				14. TOTAL NUMBER CORE BOXES 9			
7. THICKNESS OF OVERBURDEN 22.2				15. ELEVATION GROUND WATER d. 28.6 3-3-88 *			
8. DEPTH DRILLED INTO ROCK 98.2				16. DATE HOLE 3-1-88		STARTED 3-9-88 COMPLETED	
9. TOTAL DEPTH OF HOLE 120.4				17. ELEVATION TOP OF HOLE			
				18. TOTAL CORE RECOVERY FOR BORING 92 %			
				19. SIGNATURE OF INSPECTOR John C. Shaw			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	0.0		Overburden (Alluvium): Sand, Silt, Gravel, Cob- bles & Boulders			* Static water level is lower. Upon com- pletion of boring, a rock (dropped in?) or obstruction (d. 32") prevents reaching water table w/ tape and plunger.	
	2						
	4						
	6						
	8						
	10						
	12						
	14						
	16						
	18						
	20						
				Rockbitted (5 1/2" bit)	No sample		

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MAR 71

(TRANSLUCENT)

B-96

PROJECT
Cuchillo Negro ck.HOLE NO.
CN-CH-16

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-16	
PROJECT			INSTALLATION		SHEET 2 OF 6 SHEETS	
Cuchillo Negro Ck.			Albuquerque Dist.			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	20					Set 4" casing to T.O.R.
	22		Top of Rock			Began Coring w/ HQ Wireline
	22.2		Limestone, v. hd., sl. wea., hi. to intensely frac. Num. h/a frags, sl. Fe st.	61		P-1 Ran 2.6 Rec. 1.6 RQD = 21% Loss 1.0 (very poor) U.L. 1.0 Time: 17 min Fluid: H ₂ O, part. loss CD = 24.8 24.8
	23.8		Pinkish Gray			
	24		Cavernous Zone (No recovery): Probably filled or partially filled w/ sand & gravel. (depths may not be exact)			P-2 Ran 3.9 RQD = 41% Rec. 2.1 Loss 1.8 (poor) U.L. 1.8 Time: 10 min. Fluid: H ₂ O, 100% W.L. Act. Smooth CD = 28.7 28.7
	26.6		Limestone, hd. - v. hd., sl. wea. to unwea., hi. frac., w/ red. argil filler. Gray	54	Box 1	
	28		Irr. frags, op., solution faces, 40°-45°			
	28.7		Cavity			P-3 Ran 2.5 Rec. 1.0 RQD = 28% Loss 1.5 (poor) U.L. 1.5 Time: 12 min. Fluid: H ₂ O, 100% W.L. CD = 31.2 31.2
	29.7		Limestone, hd. - v. hd., unwea.	40	9	
	30		Pinkish Gray			
	30.4		Cavity or soft zone (?)			P-4 Ran 1.2 Fluid: Revert Rec. 1.2 RQD = 0% Loss 0.0 (v. poor) U.L. 0.0 32.4
	30.9		Limestone, hd. - v. hd., generally unwea., f. xln., thick bdd., stylolitic, w/ num irr. shaped argillaceous (shaly) lenses & lam. Gray w/ red. brown lenses & lam. Bdd. irr., dip. wavy. 1/4.	100		P-5 Lowered 4" cas. Ran 8.9 Rec. 8.9 Loss 0.0 U.L. 0.0 Time: 75 min Fluid: Revert, part. loss Act. Smooth RQD = 90% (Good)
	34		Hi. to intensely frac zone w/ some staining			
	35		Bdd Pgs., hi., 0°-5°	100		
	38				Box 2	
	40		Bdd Pgs., ti, irr., 1/4			
	42				9	
	44		Bdd. Pgs., ti, st., 15°	100		P-6 Ran 3.7 RQD = 89% Rec. 3.7 Loss 0.0 (Good) U.L. 0.0 Time: 45 min. Fluid: Revert, part. loss Act. Smooth CD = 41.3 41.3

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-16	
PROJECT		INSTALLATION		SHEET 3 OF 6 SHEETS		
Cuchillo Negro Ck.		Albuquerque Dist.				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	7 CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant) g
	44		Limestone... (cont.)			CD=45.0 45.0
	46		Jt., calcite on face, op., 75°			P-7 Ran 6.1 Rec 5.9 Loss 0.2 U.L. 0.2 Time: 30 min Fluid: Revert, part. loss Act: Smooth
	48		Bdd. Ptg., op., wea., soft clay filler, red. br., L/a	97	Box	RQD = 82% (Good)
	50		Bdd Ptg., ti., st., 0°-5° " " op. " "		3	
	52		Core becomes coarser in texture w/ num. fossils & w/occ wavy shale lam.		of	CD=51.1 51.1
	54		Bdd Ptg., ti., sl st., irr., L/a		9	P-8 Ran 9.4 Rec 9.4 Loss 0.0 U.L. 0.0 Time: 60 min Fluid: Revert, part loss Act: Smooth
	56		Jt., cal hld., 60°-65°			RQD = 98% (Excellent)
	58		2 Bdd Ptg., op., st., 15°-20°	100		
	60		Bdd Ptg., ti., 10°			
	62		Bdd Ptg., ti., wavy, 10°-20°			
	64		Bdd Ptg., ti., 5°-10°			
	66		Jt., cal hld., 60°			
	68		Calcareous Shale, mod hd, unwea.		d. 60.5 Wrap 3	CD=60.5 60.5
	70		Ok Gray to Black Dip: 15°-20°		d 61.1	P-9 Ran 3.4 Rec 3.1 Loss 0.3 U.L. 0.3 Time: 29 min Fluid: Rev., part. loss RQD = 68% (Fair)
	72	Cal	Shale, soft to mod. hd., hi. wea., intensely frac. along open bdd.	91	Box	CD=63.9 63.9
	74		Red. Brown to Gray Dip: 15°		4	
	76		clay, v. soft, w/ sh frags, red. br.		of	P-10 Ran 7.2 Rec 4.6 Loss 2.6 U.L. 2.6 Time: 48 min Fluid: Rex, part. loss Act: Smooth
	78		Calcareous Clay Zone (2.6' U.L.), v. soft w/ num. wea. shale frags.	64	9	RQD = 24% (v. poor)
	80		Red. Brown			

DRILLING LOG (Cont Sheet)				ELEVATION TOP OF HOLE		Hole No. CN-CH-16	
PROJECT		INSTALLATION		SHEET 44		OF 6 SHEETS	
Cuchillo Negro Ck.		Albuquerque Dist.					
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
	68		Cal. clay... (cont.)				
	69.1		Shale, hi. wea., soft	64			
	70		Limestone, hd.-whd., un- wea., f. xln., massive, stylolitic, w/ occ. irr. lenses & lam. of dk. gray shale. Also, occ. h/a cal. hld. jts. Gray Dip: 15°-25°, irr.				
	72				d. 71.1	CD=71.1	71.1
	74		Bdd. Ptg., ti., irr.		wrap #4	P-11 Ran 10.0 Rec 10.0 Loss 0.0 U.L. 0.0 Time: 75 min. Fluid: H ₂ O, part. loss Act: Smooth	
	76		Cal hld. jt., 60°-65°		d. 72.3		
	78		2 Bdd. Ptg., ti., irr., 15°-25°		Box 5	RQD=97% (Excellent)	
	80			100	of 9		
	82					CD=81.1 81.1	
	84					P-12 Ran 9.9 Rec 9.9 Loss 0.0 U.L. 0.0 Time: 78 min. Fluid: H ₂ O part. loss Act: Smooth	
	86		Bdd. Ptg., ti., irr.		d. 85.6	RQD=99% (Excellent)	
	88			100	Wrap #5		
	90		Bdd Ptg., op., thin clay, 5°		d. 86.6		
	92		" " " " " 75°-90°		Box 6		
					of 9		
			Bdd. Ptg., op., 15°			CD=91.0 91.0	

DRILLING LOG (Cont Sheet)				ELEVATION TOP OF HOLE		Hole No. CN-CH-16	
PROJECT			INSTALLATION			SHEET 5 OF 6 SHEETS	
Cuchillo Negro Ck.			Albuquerque Dist.				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
	92		Limestone... (cont.) Jt., op., cal. xln on face. 60°-65° Bdd Ptg., op., 15°		Box	P-13 Ran 10.1 Rec. 10.1 Loss 0.0 U.L. 0.0 Time: 70 min Fluid: H ₂ O part. loss Act.: smooth	
	94.0		Gradational Contact Eutecarous Shale, mod. hd., unwea., fos., mass. Dk Gray Dip: 15° Bdd Ptg., ti., 15°	100	7 of 9	RQD = 99% (Excellent)	
	96						
	98				d 97.8 Wrap #6 d 98.7		
	100					CD = 101.1 101.1	
	102						
	104		Bdd. Ptg., op., 10°-15° 2 parallel jts, cal. hld., Fest., 70°-75°		d 103.1 Wrap #7 d 104.3	P-14 Ran 10.0 Rec. 9.7 Loss 0.3 U.L. 0.3 Time: 75 min Fluid: H ₂ O, part. loss Act.: smooth	
	106			97		RQD = 95% (Excellent)	
	107.1		Bdd. Ptg., op., 10°-15°		Box 8 of 9		
	108		Limestone, hd., sl. wea. to unwea., f. xln., sl. shaly, fos. Gray Dip: 10°-15°				
	110						
	112		Cored along vert., par- tially hld., st., irr. fracs., op. to ti.			CD = 111.1 111.1	
	114						
	116			100	Box 9 of 9	P-15 Ran 9.3 Rec. 9.3 Loss 0.0 U.L. 0.0 Time: 80 min. Fluid: H ₂ O, part. loss Act.: smooth RQD = 96% (Excellent)	

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-16		
PROJECT Cuchillo Negro Ck.		INSTALLATION Albuquerque Dist.		SHEET 6 OF 6 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	116		Limestone... (cont.)		d. 117.2	
	118			100	Wrap # 8	
	118.9		Irr. frac., ti.		d. 118.1	
	120		Shale, mod. hd., unwea., sl cal. w/ occ. slicks. Ok. Gray Dip: 15°-20°			
	120.4		Slicks, 30°-35° B.O.H.			CD: 120.4 120.4
			Pressure Tests: (HQ Single Packer)			
			Air Press = 140 psi (All tests)			
		①	Test interval: d. 73' to 120.4 (B.O.H.)			
			H ₂ O Press = 73' x .43 = 31 psi			
			Gage " = 5 psi	0.11		
			Total Press = 36 psi			
			Take = 4 gal./5 min			
		②	Test interval: d. 53' to 120.4 (B.O.H.)			
			H ₂ O Press = 53' x .43 = 23 psi			
			Gage " = 10 psi	0.80		
			Total " = 33 psi			
			Take = 30 gal./5 min.			
		③	Test interval: d. 33' to 120.4 (B.O.H.)			
			H ₂ O Press = 33' x .43 = 14 psi			
			Gage " = 5 psi			
			Total " = 19 psi	0.82		
			Take = 30.7 gal./5 min.			
						* 4" cas. @ d. 32.5'

DRILLING LOG		DIVISION	S.W.D.		INSTALLATION	ALB. DIST.		SHEET	1
1. PROJECT		RIO GRANDE FLOODWAY T or C UNIT, N.M.			10. SIZE AND TYPE OF BIT		HQ WIRELINE		
2. LOCATION (Coordinates or Station)		N 807.673; E 658.535			11. DATUM FOR ELEVATION		N.G.V.D.		
3. DRILLING AGENCY		ALB. DISTRICT			12. MANUFACTURER'S DESIGNATION OF DRILL		FALLING 314		
4. HOLE NO. (as shown on drawing 816 and 816 number)		CN-CH-17			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		0	0	0
5. NAME OF DRILLER		MOBILE DISTRICT			14. TOTAL NUMBER CORE BOXES				
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER				
7. THICKNESS OF OVERBURDEN		22.4			16. DATE HOLE		STARTED	15 MAR 88	COMPLETED
8. DEPTH DRILLED INTO ROCK		47.1			17. ELEVATION TOP OF HOLE		4721.5		
TOTAL DEPTH OF HOLE		69.5			18. SIGNATURE OF INSPECTOR		John C. Shaw		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1		Overburden: (not sampled)			Rockbitted through overburden using 'Polygel' mud from the surface to Top of Rock
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-CH-17

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-17	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 2 OF 4 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERED e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21					Set casing to 22.2'
	22		Approx. Top of Rock			Began coring 'R' Barrel 22.4
	23		Silty Sandstone, soft, fri. h. wea. cal. v.f. gr. weakly contd. intensely frac. w/ num. embedded limestone fragments. Tan	76		P-1 Ran 2.1 Fluid: Polygel Rec. 1.6 D.V.R. Loss 0.5 RQD = 0% UL. 0.5 v. poor Time: 8 min. CD = 24.5 24.5
	24					
	25					
	26				Box 1	P-2 Ran 4.3 Rec. 4.3 Loss 0.0 UL. 0.0 Time: 15 min. Fluid: Polygel D.V.R. Act.: Smooth RQD = 9% v. poor
	27		Limestone, hd. thinly interbdd. w/ fri. silty sandstone, intensely frac. Gray & Tan	100	of 5	
	28		Limestone, hd. mod. to h. wea. mod. to h. frac. thin to med. bdd. w/ num. v. soft shaly-clay lan. Lt. Gray Dip: Variable, wavy, L/a			CD = 28.8 28.8
	29					P-3 Ran 4.3 Rec. 4.3 Loss 0.0 UL. 0.0 Time: 20 min. Fluid: Polygel D.V.R. Act.: Smooth RQD = 67% Fair
	30					
	31			100		
	32		Shaly-Clay lan. v. soft, fri. gray			CD = 33.1 33.1
	33					P-4 Ran 4.6 Rec. 4.6 Loss 0.0 UL. 0.0 Time: 25 min. Fluid: Polygel D.V.R. Act.: Smooth R.Q.D. = 76% Good
	34					
	35			100	35.4 Wrap	
	36		Shale, soft sl. to mod. wea. sl. cal. w/ several h/a to vert. th. jts. Olive Green to Red Brn. Dip: 15%		36.7	CD = 37.7 37.7
	37		Note: Core is very brittle and readily breaks into short (.03'-.04') pieces after air exposure.			
	38				Box 2	P-5 Ran 4.7 Rec. 4.7 Loss 0.0 UL. 0.0 Time: 22 min. Fluid: Polygel D.V.R. Act.: Smooth RQD = 11% V. Poor
	39				of 5	
	40			100		
	41					
	42					CD = 42.4 42.4
	43		Cal. Clay, v. soft, red-brown Possible shear zone?	100		P-6 Ran 1.0 UL. 0.0 Rec. 1.0 RQD = 0% CD = 43.3 V. Poor 43.3
			Shale, soft, mod. wea. int frac. to shattered, occ. slicks.			

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(SR 1170-1-1807) GPO 1966 O-555-000

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-CH-17

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-17	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 3 OF 4 SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of cuttings, etc., if significant)
			Shale- (cont.) Red. Brown			P-7 Ran 4.7 Rec. 4.3 Loss 0.4 UL. 0.4 Time : 35 min. Fluid : Polygel DWR.
	45		Shale, soft to mod. hd. sl. wea. sl. cal. to non-cal. hd. to intensely frac. brittle, w/ occ. slicks (30-45 deg.). Occ. h/a cal. hld. jts. Reddish Brown Dip : L/a	91		
	46				47.1	
	47				Wrap	
	48				82	CD = 48.1 48.1
	49				48.1	P-8 Ran 4.8 Rec. 4.3 Loss 0.2 UL. 0.2 Time : 48 min. Fluid : Polygel, 100% circ. loss @ 50.4 Grouted w/ 2 bag cem. RQD = 82% Good
	50		Limestone, frac. along h/a op. jt. 0.2' op. cav. sl. wea.	96	Box 3 of 5	
	51		Limestone, hd-vhd. sl. wea. to unwea. f. to micro xin. med. to thick bdd. fas. w/ occ. shale laminae. Gray w/ red tint Dip : L/a, irr. Bdd. Ptg. op. 0 deg. Bdd. Ptg. tl. st. irr. L/a			CD = 52.6 52.6
	52					
	53		Small cavities or soft zones			Changed to HQ Wireline P-9 Ran 6.7 Rec. 6.5 Loss 0.2 UL. 0.2 Time : 60 min. Fluid : H2O, 100% loss Act. : Smooth RQD = 85% Good
	54					
	55		Vert. frac. irr. cal. hld. sl. wea.	97		
	56		Bdd. Ptg. tl. st. irr. 15 deg.			
	57		Bdd. Ptg. tl. st. irr. 15 deg.		57.5	
	58		Vert. frac. irr. cal. hld.		Wrap	
	59		Bdd. Ptg. op. 5-10 deg.		83	
	60				58.6	CD = 59.3 59.3
	61		Bdd. Ptg. tl. 10-15 deg.			P-10 Ran 10.2 Rec. 10.0 Loss 0.2 UL. 0.2 Time : 75 min. Fluid : H2O, 100% loss Act. : Smooth RQD = 85% Good
	62		Bdd. Ptg. tl. 10-15 deg.		Box 4 of 5	
	63		Bdd. Ptg. op. wea. st. 0-5 deg.			
	64		Bdd. Ptg. tl. st. 5-10 deg.	98		
	65		Jt. op. cal. on face, st. 75 deg.			
	66		2 Bdd. Ptg. op. 0-5 deg.			
	67		Bdd. Ptg. tl. 15 deg.		66.6	
					Wrap	
					84	
					67.7	

ENG FORM 1836-A (DR 1110-1-1807)

USE 1000 OF 000-000

PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M. HOLE NO. CN-CH-17

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-17	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 4 OF 4 SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Logging time, water loss, depth of measuring, etc., if significant)
			Limestone (cont.)		Box 5	
69						CD = 69.5 69.5
70			Bottom of Hole			
71			<u>Pressure Tests</u>			
72			HQ Single Packer			
73		①	Test Interval: 64.7 to 69.5 (BOH) 64.7 x .43 = 28 psi (H2O press.) Gage: 10 psi Total Press.: 38 psi Take = 12 gal/5 min.			
74		②	Test Interval: 59.7 to 69.5 (BOH) 59.7 x .43 = 26 psi (H2O press.) Gage: 10 psi Total Press.: 36 psi Take = 28 gal/5 min.			
75		③	Test Interval: 48.3 to 69.5 (BOH) 48.3 x .43 = 21 psi (H2O press.) Gage: 5 psi Total Press.: 26 psi Take = 220 gal/5 min.			
76						
77						
78						
79						
80						
82						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						

ENG FORM 1836-A

(OR 1110-1-1001)

USE 1000 07-000-000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.
CN-CH-17

DRILLING LOG		DIVISION S.W.D.		INSTALLATION ALB. DIST.		SHEET 1 OF 6	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				1. RISE AND TYPE OF BT HQ WIRELINE			
2. LOCATION (Coordinates or Station) N 80° 43' 0" E 657,960				3. DATE FOR ELEVATION (Top of B.C.) N.G.V.D.			
4. DRILLING METHOD ALB. DISTRICT				5. MANUFACTURER'S DESIGNATION OF DRILL FAILING 314			
6. HOLE NO. (As shown on drawing B.C. and file number) CN-CH-18				7. TOTAL NO. OF CORES		8. TOTAL NUMBER CORES BORED	
9. NAME OF DRILLER MOBILE DISTRICT				10. ELEVATION GROUND WATER d. 42 ft. 3-18-88		11. DATE MOLE	
12. ELEVATION OF HOLE				13. DATE MOLE		14. DATE MOLE	
15. THICKNESS OF OVERBURDEN 0.0				16. ELEVATION TOP OF MOLE 4740.2		17. TOTAL CORE RECOVERY FOR BORING 92%	
18. DEPTH DRILLED INTO ROCK 119.8				19. SIGNATURE OF SUPERVISOR John C. Shaw			
TOTAL DEPTH OF HOLE 119.8							

ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	5 CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1		Limestone, hd. sl. wea. f. xln, occ. Fe st. hl. to intensely frac. Reddish Gray Dp: 10-15 deg. 2.0' core loss distributed throughout run (D.T.R.) Rock @ surface not in situ.	60		Began Coring w/ "R" bbl. (2 3/4" x 3 7/8") P-1 Ran 5.0 Rec. 3.0 Loss 2.0 U.L. 2.0 D.T.R. Time: 15 min. Fluid: H2O part. loss Act: Rough RQD = 8% v. poor
	2					
	3					
	4					
	5		Jt. tl. 65-70 deg.		Box	CD = 5.0 5.0
	6			100	1	P-2 Ran 2.7 RQD = 67% Rec. 2.7 Fair Loss 0.0 U.L. 0.0 Time: 10 min. Fluid: H2O 100% loss CD = 7.7 7.0
	7				11	
	8		Jt. op. hl. wea. st. 70-75 deg.	64		P-3 Ran 1.1 U.L. 0.4 Rec. 0.7 Fluid: H2O 100% loss CD = 8.8 RQD = 36% poor
	9		Limestone, hd. mostly unwea. f. xln. Gray Dp: 10-15 deg. h/a solution face, 75 deg.			P-4 Ran 1.6 Time: 10 min. Rec. 1.6 Fluid: H2O w/ Loss 0.0 "Polygel", 100% loss U.L. 0.0 RQD = 63% Fair CD = 10.4 10.4
	10		Clay seam, v. soft, gray	100		
	11		Shaly ptgs. tl. 15 deg.		11.3	P-5 Ran 3.6 Rec. 3.4 Loss 0.2 U.L. 0.2 Time: 20 min. Fluid: "Polygel", 100% loss Act: Smooth RQD = 69% Fair CD = 14.0 14.0
	12			94	81	
	13				12.5	
	14		Vert. Jt. hl. wea. Fe st. sol. faces.			P-6 Set 4' cas. to 14.5 Ran 4.6 Rec. 3.9 Loss 0.7 U.L. 0.7 Time: 30 min. Fluid: H2O part. loss Act: Smooth RQD = 54% Fair CD = 18.6 18.6
	15			85		
	16		Bdd. Ptg. tl. 15 deg.			
	17		Bdd. Ptg. op. sl. clayey, 20 deg.			
	18		Bdd. Ptg. tl. 15 deg.			
	19		Bdd. Ptg. tl. 15-20 deg.	100		P-7 Ran 2.9 Rec. 2.9 Loss 0.0

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PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M. HOLE NO. CN-CH-18

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-18		
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 2 OF 6		
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	5 CORE RECHARGE e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of penetration, etc., if significant) g	
	21		Decomposed zone: Clay & Silt (decomposed limestone), friable to v. soft, st. cal. w/ hl. wea. limestone frags. & base. Brown	100	Box 2 of 11	U.L. = 0.0 Fluid: H ₂ O, part. loss R.Q.D. = 69% Fair CD = 21.5 21.5	
	22						P-8 Ran 2.4 R.Q.D. = 0% Rec. 2.4 v. poor Loss 0.0 Time: 12 min. Fluid: H ₂ O, part. loss
	23						CD = 23.9 23.9
	24		L.S. hd. Fe st. hl. wea. br. Limestone, hd-v. hd. sl. wea. to unwea. f. xln. thick bdd w/ occ. cal. hd. jts. Gray w/ red Dip: 20 deg. + or -, hr.	100	25.0 Wrap #2	P-9 Ran 4.7 Rec. 4.7 Loss 0.0 U.L. 0.0 Time: 35 min. Fluid: H ₂ O, part. loss Act: smooth R.Q.D. = 77% Good	
	25						
	26						
	27		Bdd. Ptg. tl. st. 5 deg. Bdd. Ptg. tl. st. 25 deg.	100			
	28		Hl. wea. seam, intensely frac., Fe. st. op. Vuggy, st.		Box 3 of 11	CD = 28.6 28.6	
	29		Jt. op. hl. wea. st. 70 deg.				
	30		Bdd. ptg. tl. 5 deg.	100		P-10 Ran 3.7 Rec. 3.7 Loss 0.0 U.L. 0.0 Time: 28 min. Fluid: H ₂ O, part. loss Act: smooth R.Q.D. = 92% Excellent	
	31		Bdd. ptg. tl. 5 deg.				
	32					CD = 32.3 32.3	
	33		core bbl. blocked, drl. frags., core spin	72		Changed to HQ Wireline P-11 Ran 8.6 Rec. 6.2 Loss 2.4 U.L. 2.4 Time: 48 min. Fluid: Revert. part. loss Act: smooth R.Q.D. = 62% Fair	
	34						
	35						
	36		Limestone ledge, sol. sur.	72			
	37		Cavity				
	38		Limestone, hd-v. hd. unwea. f. xln. thick bdd to mass. w/num. h/a cal. hd. jts. & frags. Gray w/ red streaks Dip: 10 to 15 deg.		38.8 Wrap #3		
	39			100	39.7		
	40						
	41		Bdd. Ptg. tl. 10 to 15 deg. Several h/a cal. hd. frags.		Box 4 of 11	CD = 40.9 40.9	
	42			100		P-12 Ran 9.2 Rec. 9.2 Loss 0.0 U.L. 0.0 Time: 35 min. Fluid: Revert. part. loss	
	43						

END FORM 1336-A

(REV 1110-1-1001)

GPO 1955 OF-500-500

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.
CN-CH-18

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-18	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 3 OF 6	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	SCORE PERCENT e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of penetration, etc., if significant) g
	45		Limestone...(cont.) Num. h/a cal. hld. jts.	100	Box 4	Act. : smooth R.Q.D. = 98% Excellent
	46		Jt. op. 25 to 30 deg.			
	47					
	48		Bdd. Ptg. tl. 0 to 5 deg.		18.0 Wrap	
	49				84	
	50		Bdd. Ptg. tl. 10 to 15 deg.		49.2	CD = 50.1
	51				Box 5	P-13 Ran 8.9 Rec. 8.9 Loss 0.0 UL. 0.0 Time : 52 min. Fluid : Revert. 100% Loss @ 54' Act. : smooth R.Q.D. = 88% Good
	52		Bdd. Ptg. tl. red st. 20 deg.		11	
	53		Jt. cal. slick op. 0 deg.			
	54		Limestone, hd, unwea. argil. fos. stylolitic thick bdd. w/ num. irr. shape, shale pkts. & lan Gray	100		
	55		Dip : L/a, irr. wavy bdd. irr. frags. cored along edge of open cavity, 100% V.L.			
	56		Bdd. Ptg. tl. red st. irr. L/a.			
	57					
	58					
	59		Num. shale pkts. dk. gray			CD = 59.0
	60		H. to intensely frac. w/ occ. red & green staining on irr. frac. surfaces			P-14 Ran 8.5 Rec. 8.5 Loss 0.0 UL. 0.0 Time : 48 min. Fluid : H2O, 100% loss Act. : smooth R.Q.D. = 81% Good
	61					
	62					
	63			100	63.5 Wrap	
	64				85	
	65				64.5	
	66					
	67					

ENG FORM 1036-A

(BY 1110-1-1801)

SPR 1000 OF-000-000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

PROJECT

CN-CH-18

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-18		
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 4 OF 6 SHEETS		
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	S CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	69		Limestone (cont.) Jt. partially op. cal on faces, red st. 70 to 75 deg.	100		P-15 R.Q.D. = 73% Ran 3.3 Fair Rec. 3.3 Loss 0.0 UL. 0.0 Time : 25 min. Fluid : H2O, 50% loss	
	70		Jt. cal. hld. 65 deg. strike perpendicular to above jt.				
	71		Cal. Shale bands, mod. hd. red. br.			CD = 70.8 70.8	
	72		Cal. Shale, mod. hd. w/ op. bdd. ptgs. Red. Brown	97	71.7 Wrap 86 72.6	P-16 Ran 10.0 Rec. 9.7 Loss 0.3 UL. 0.3 Time : 60 min. Fluid : Revert, 20% loss Act : Smooth R.Q.D. = 89%, Good	
	73						
	74		Limestone (cont.)				
	75				Box 7 of 11		
	76			100		P-17 Ran 9.2 Rec. 9.2 Loss 0.0 UL. 0.0 Time : 56 min. Fluid : Revert, 20% loss Act : Smooth R.Q.D. = 90% Excellent	
	77		Bdd. Ptg. op. red st. 10 deg.				
	78		Bdd. Ptg. op. red st. cal. crystals, 15 to 20 deg. Jt. op. red st. cal. faces, 55 to 60 deg.				
	79		Bdd. Ptg. op. shaly, 15 deg.				
	80		Bdd. Ptg. op. 15 deg.				
	81						CD = 80.8 80.8
	82		Bdd. Ptg. tl. st. 20 to 25 deg.				
	83		Bdd. Ptg. tl. st. 20 to 25 deg.				
	84		Jt. cal. hld. 85 to 90 deg.				
	85						
	86		Bdd. Ptg. op. 0 to 5 deg.	11	Box 8 87.8 Wrap 88 88.4	CD = 90.0 90.0	
	87		Cal. Shale, soft - mod. hd. sl. wea. w/ occ. bdd. ptgs. & occ. h/a cal. hld. jts. Red. Brown to Gray Dip : 15 deg.				
	88		Bdd. Ptg. tl. 15 deg.				
	89		Core spms		of 11		
	90		Core Loss Zone (3.4') : Probably hl. wea. to decomposed shale.				
	91						

ENR FORM 1836-A
JAN 67

(EN 1110-1-1801)

SPS 1000 OF-000-000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

FILE NO.
CN-CH-18

PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.				INSTALLATION ALBUQUERQUE DISTRICT		Hole No. CN-CH-18 SHEET 5 OF 6 SHEETS	
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	LOGGED e	BOX OR SHOULDER NO. f	REMARKS (Depth, time, water, amount, etc. if significant)	
	93		Core Loss Zone (cont.)			P-18 Ran 10.0 Rec. 6.6 Loss 3.4 U.L. 3.4 Time : 65 min. Fluid : 'Polygel', 20% loss Act. : Smooth	
	94		Shale (cont.) Intensely frac. op. bdd.				
	95						
	96		Gradational Contact	56		R.Q.D. = 43% poor	
	97		Limestone, hd.-v. hd. unwea. f. xln. styl. fos. thick bdd. to mass. w/ occ. lenses & lan. of shale Gray Dip : L/a, wavy, irr.		96.3 Wrap #9 97.2		
	98				Box		
	99		Jt. tl. irr. 75 deg.		9		
	100		Bdd. Ptg. op. irr. st. 0 deg.		of	CD = 100.0 100.0	
	101				11	P-19 Ran 9.8 Rec. 9.7 Loss 0.1 U.L. 0.1 Time : 63 min. Fluid : 'Polygel' 20% loss Act. : Smooth	
	102					R.Q.D. = 97% Excellent	
	103						
	104		Bdd. Ptg. tl. irr. L/a.	99			
	105						
	106						
	107				106.8 Wrap		
	108		core spin		#10 107.9		
	109		Num. irr. shale lenses		Box		
	110					CD = 109.8 109.8	
	111				10	P-20 Ran 10.0 Rec. 10.0 Loss 0.0 U.L. 0.0 Time : 58 min. Fluid : 'Polygel', 20% Loss Act. : Smooth	
	112		Bdd. Ptg. op. irr. 5 deg.		of	R.Q.D. = 97% Excellent	
	113		Bdd. Ptg. tl. st. styl. 15 deg.		11		
	114		Bdd. Ptg. tl. st. styl. 25 deg.				
	115		Jt. cal. Hd. 60 deg.				
					115.8		

ENG FORM 1336-A
JUN 67

(BY 1110-1-1801)

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PROD-8007

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

CN-CH-18

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-18	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 6 OF 6 SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OF SAMPLES NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
117			Shaly w/ num. fos.	100	Wrap #11	
118			Bdd. Ptg. tl, 15 deg.		Box	
119			Bdd. Ptg. tl, 15 deg.		11	
120					of	
					11	CD = 119.8 119.8
			BOH.			
			Pressure Tests (HQ Single Packer)			Note: Pressure Tests above 67.5 may not be representative of H2O loss zones, because the hole was grouted when BOH was 67.5 in order to improve circulation return.
		①	Test Interval : 93.4 - 119.8 (BOH) H2O Press. : 93.4 x .43 = 40 psi Gage : 0 psi Take = 0 gal. / 5 min.			
		②	Test Interval : 73.4 - 119.8 (BOH) H2O Press. : 73.4 x .43 = 32 psi Gage : 5 psi Total Press : 37 psi Take = 11 gal. / 5 min.			
		③	Test Interval : 43.4 - 119.8 (BOH) H2O Press. : 43.4 x .43 = 19 psi Gage : 5 psi Total Press : 24 psi Take = 1.5 gal. / 5 min.			
		④	Test Interval : 33.4 - 119.8 (BOH) H2O Press. : 33.4 x .43 = 14 psi Gage : 5 psi Total Press : 19 psi Take = 1 gal. / 5 min.			
		⑤	Test Interval : 24.4 - 119.8 (BOH) H2O Press. : 24.4 x .43 = 10 psi Gage : 5 psi Total Press : 10 psi Take = 5 gal. / 5 min.			
		⑥	Test Interval : 16.5 - 119.8 (BOH) H2O Press. : 16.5 x .43 = 7 psi Gage : 3 psi Total Press : 10 psi Take = 32 gal. / 5 min.			

ENG FORM 1836-A
JAN 67

(REV 1110-1-1801)

SPS 1000 OF 1000-1000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

FILE NO.
CN-CH-18

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
PROJECT		S.W.D.		ALB. DIST.		OF 5 1	
1. PROJECT		RIO GRANDE FLOODWAY		10. SIZE AND TYPE OF BIT		"R" bbl. & HQ Wireline	
2. LOCATION (Coordinates or Station)		T or C UNIT, N.M.		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		N.G.V.D.	
3. LOCATION		N 806 675 E 658 165		12. MANUFACTURER'S DESIGNATION OF DRILL		Failing 314	
4. DRILLING AGENCY		ALB. DISTRICT		13. TOTAL NO. OF OVER-		DISTURBED	
5. HOLE NO. (As shown on drawing title and its number)		CN-CH-19		14. TOTAL NUMBER CORES BORER		8	
6. NAME OF DRILLER		Mobile District		15. ELEVATION GROUND WATER			
7. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		16. DATE HOLE		STARTED 3-24-88 COMPLETED 3-29-88	
8. THICKNESS OF OVERBURDEN		9.6		17. ELEVATION TOP OF HOLE		4658.8	
9. DEPTH DRILLED INTO ROCK		90.9		18. TOTAL CORE RECOVERY FOR BORING		83%	
TOTAL DEPTH OF HOLE		100.5		19. SIGNATURE OF INSPECTOR		John C. Shaw	

ELEVATION	DEPTH	LOGGING	CLASSIFICATION OF MATERIALS (Description)	5 CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
1			Overburden (Alluvium) Sand, Silt, Gravel, & Cobbles			Rockbitted to T.D.R. using bentonite mud.
2						Note: Hole fallen in to d. 82 + or - on 4-6-88 (dry)
3						
4						
5						
6						
7						
8						
9						
10			Top of Rock (?) Limestone, ground away w/ rockbit. (driller thought he was in boulders)			Set 4' cas. to 13.6
11						Began Coring w/ "r" bbl. (2.75' x 3.875')
12						
13			Clay seam, v. soft, cal.			13.5
14			Limestone, soft to mod. hd. hl. wea. to decon. hl. to intensely frac. w/ occ. v. soft clay seams. Tan Dip: 30 deg.	81		P-1 Ran 1.6 UL. = 0.3 rec. 1.3 R.Q.D. = 44% Loss: 0.3 Poor CD = 15.1 15.1
15						
16			Clay seam, v. soft, cal. red br. Clay & hl. wea. L.S. frl		Box	P-2 Ran 4.0 Rec. 4.0 Loss 0.0 UL. 0.0 Time: 25 min. Fluid: Bent, D.V.R. Act. smooth R.Q.D. = 20% V. Poor
17				100	1	
18			Cal. Shale, mod. hd. hl. wea. mt. frac. Tan		of	
19			Decon. Zone: Clay, v. soft & frl cal. shale. Tan to Red Br.		8	CD = 19.1 19.1 P-3 Ran 4.8

END FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-CH-19

DRILLING LOG (Cont. Sheet)			ELEVATION TOP OF HOLE 4658.8		Hole No. CN-CH-19	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 2 OF 5 SHEETS	
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	LOGS RECORDED e	BOX OF SAMPLES f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21	///	Cal. Shale, soft, hl. wea. to decon, fri, Tan	100	Box 1 of 8	Rec. 4.8 Loss 0.0 UL. 0.0 Time : 45 min. Fluid : Bentonite, DVR Act. : Smooth R.Q.D. = 8% V. Poor
	22	///	Cal. Shale, mod. hd, hl. wea, intensely frac. to shattered. Num. h/a tl frac. Fe. st. Tan Dip : 30 to 35 deg. Falls apart when handled.			CD = 23.9 23.9
	23	///				
	24	///				
	25	///				P-4 Ran 3.9 Rec. 3.9 Loss 0.0 UL. 0.0 Time : 36 min. Fluid : Bent. DVR. Act. : Smooth R.Q.D. = 0% V. Poor
	26	///	Clay, v. soft, cal, red. br.	100	Box 2 of 8	CD = 27.8
	27	///	Cal. Shale, soft to mod. hd. hl. wea. to decon, intensely frac. to shattered. Tan Dip : 30 to 35 deg. Falls apart when handled			P-5 Ran 4.6 Rec. 4.6 Loss 0.0 UL. 0.0 Time : 60 min. Fluid : Bent. D.V.R. Act. : Smooth R.Q.D. = 43% , Poor
	28	///				
	29	///				
	30	///	Limestone, hd, mostly L. wea. f. to micro xln, thick bdd. Gray Dip : 30 to 40 deg.	100		CD = 32.4 32.4
	31	///	Jt. sl. wea. cc. hld, st above frac.			
	32	///				
	33	///			Wrap #1 33.4	Changed to HQ Wireline P-6 Ran 8.9 Rec. 8.9 Loss 0.0 UL. 0.0 Time : 85 min. Fluid : Bent. D.V.R. Act. : Smooth R.Q.D. = 100% Excellent
	34	///	Bdd. Ptg. tl. irr. 35 deg.			
	35	///	Bdd. Ptg. tl. irr. 35 deg.			
	36	///				
	37	///	Jt. tl. cal. on face, 55 deg.	100	Box 3 of 8	CD = 41.3 41.3
	38	///				
	39	///	Bdd. Ptg. tl. 30 to 35 deg.			
	40	///				
	41	///	Jt. tl. sl. wea. cal. on face, 35 to 40 deg.			
	42	///	Bdd. Ptg. tl. st. 35 deg.			P-7 Ran 10.0 Rec. 8.8 Loss. 1.2 UL. 1.2 Time : 65 min. Fluid : Bent. D.V.R.
	43	///	Jt. op. st. cal. on face 70 deg. Irr. frac. op. st. Clay, v. soft, op. wea. rock fracs, Tan			

ENG FORM 1836-A
JUN 67

(BY 1110-1-1801)

SPC 1205 07-000-000

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-CH-19

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4658.8		Hole No. CN-CH-19	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 3 OF 5 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	1 CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	45		Limestone (cont.)			Act. : Smooth RQD = 65% Fair
	46		Irr. frac. wea. op.		45.6 Wrap	
	47		Irr. frac. wea. op.	88	82 46.7	
	48		Jt. op. wea. st. 50 deg.			
	49		Sl. wea. hl. frac. w/ num. op. bdd. ptgs. & w/ red. br. shale lenses & lam.		Box	
	50		Pitted, hl. wea. irr. surface		4	
	51		3.6 ft. Core Loss Probably Clay filled cavity		of	
	52				8	CD = 51.3 51.3 P-8 Ran 4.2 Rec. 1.8 Loss 2.4 UL. 2.4 Time : 27 min. Fluid : Bent, 100% Loss of circulation Act. : Rough R.Q.D. = 0% V. Poor
	53			43		
	54		Shale, med. hd. mod. to hl. wea. sl. cal. to cal. intensely frac. to shattered. Red. Brown			
	55		Clay seam			CD = 55.5 55.5 P-9
	56		Limestone, hd. sl. wea. to unwea. f. to micro xin. Gray Dip : 35 to 55 deg.		56.3 Wrap	Ran 3.4 Rec. 3.4 Loss 0.0 UL. 0.0 Time : 15 min. Fluid : H2O & Quick Gel 100% Loss R.Q.D. = 94% Excellent
	57		Shale lam. hl. fragmented	100	83 57.2	
	58					CD = 58.9 58.9 P-10
	59		Core shattered from drill action (too much hydraulic pressure)			Ran 2.4 Time : 15 min. Rec. 0.9 Fluid : H2O Loss 1.5 100% Loss UL. 1.5 R.Q.D. = 38% Poor
	60		Sl. st. LT. Tan	38	Box	
	61		Cavity Clay filled (?)		5	
	62				of	CD = 61.3 61.3 P-11
	63		wea. surface, fragmented		8	Ran 10.0 Rec. 8.8 Loss 1.2 UL. 1.2 Time : 75 min. Fluid : H2O & Quick Gel 100% Loss
	64		Limestone, hd. mostly unwea. f. xin. med. bdd. w/ occ. op. bdd. ptgs. Gray Dip : 35 to 45 deg.			Act. : Rough to Smooth R.Q.D. = 72% Fair
	65		Bdd. Ptg. tl. cal. 45 deg.	88	64.1 Wrap	
	66				84 65.1	
	67		Bdd. Ptg. op. wea. L/a			
			Small cavity (0.1-0.2) op. sol. sur.			
			Bdd. Ptg. tl. 30 to 35 deg.			

ENG FORM 1836-A
JAN 67

(BY 1110-1-1801) GPO 1969 OF-200-000

PROJECT RIO GRANDE FLOODWAY
T or C UNIT, N.M. HOLE NO. CN-CH-19

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4658.8		Hole No. CN-CH-19	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			DETAILED ALBUQUERQUE DISTRICT		SHEET 4 OF 5	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	LOG RECORD- ING e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of penetration, etc., if significant) g
			Small Cavity (0.1), op. sol. sur. Limestone-(cont.)			
	69		Irr. frac. tl. sl. wea. Sl. wea. stain. cal. hld. frags. Bdd. Ptg. op. wea.			
	70					
	71		Jt. cal. hld. 53 deg.		Box	CD = 71.3 71.3
	72				6	P-12 Ran 12.4 Rec. 8.2 Loss 4.2 UL. 4.2
	73		Bdd. Ptg. tl. shaly, L/a		72.8 Wrap	Time : 70 min. Fluid : H2O, 100% Loss Act. : Smooth
	74		Bdd. Ptg. op. irr. L/a		85	
	75		Bdd. Ptg. tl. 35 deg.		73.9	R.Q.D. = 71% Fair
	76				of	Note : Core bbl. dropped from 81 + or - to d. 83.7
	77		Frac. op. sl. wea. cal. 35 deg.		8	Plunker sank to d. 85.0 into v. soft clay muck.
	78		Bdd. Ptg. op. irr. 30 to 35 deg.	66		
	79					
	80		Clay Filled Cavity : Clay, v. soft, silty, sl. cal. w/ num. small frags. of L.S. Clay becomes indurated when sun dried but is v. soft to mucky when fresh.			
	81		Reddish Brown			
	82					
	83				Box	83.7
	84				7	P-13 Ran 5.4 Rec. 3.3 Loss 2.1 UL. 2.1
	85				of	Time : 5 min. Fluid : H2O, 100% Loss Act. : Smooth
	86			61	8	R.Q.D. = 0% V. Poor
	87					
	88					
	89					CD = 89.1 89.1
	90					P-14 Ran 3.8 Rec. 2.1 Loss 1.7 UL. 1.7
	91			33		Time : 12 min. Fluid : H2O, 100% Loss Act. : Rough

ENG FORM 1036-A
JAN 67

(BY 1110-1-1001)

OPS 1000 OF-000-000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.
CN-CH-19

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE 4658.8		Hole No. CN-CH-19	
PROJECT RIO GRANDE FLOODWAY T or C UNIT, N.M.			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 5 OF 5 SHEETS	
ELEVATION a	DEPTH b	LOGGED c	CLASSIFICATION OF MATERIALS (Description) d	LOG CORRECTION e	BOX OF SAMPLES NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	93		Limestone, hd to v. hd, unwea. sl. shaly, med. bdd, hi. frac. w/ several h/a cal. hld. jts. & fracs. Gray Dip: 15 to 30 deg.		Box	R.Q.D. = 0%, V. Poor CD = 92.9 92.9
	94		Bdd. Ptg. tl. L/a		7	P-15 Ran 7.6 Rec. 7.6 Loss 0.0 U.L. 0.0 Time: 45 min. Fluid: H2O 100% Loss Act.: Rough R.Q.D. = 74%, Fair
	95				95.1	
	96		4 Bdd. Ptg. op. L/a	100	Wrap	
	97		Jt. partially op, cal on face, 65 deg.		#6	
	98		Jt. partially op, cal on face, 65 deg.		96.1	
	99		Bdd. Ptg. tl. 10 to 30 deg.		Box	
	100				8	
	101				of	
	102				8	
	103					
			BDH			CD = 100.5
			Pressure Tests (HQ Single Packer)			
		①	Interval: d. 73.5 to 100.5 (BDH) H2O Press.: 73.5 x .43 = 32 psi Gage: 2-3 psi (35 psi total) Take = 141 gal/ 5 min.			
		②	Interval: d. 58.5 to 100.5 (BDH) H2O Press.: 58.5 x .43 = 25 psi Gage: 2-3 psi (28 psi total) Take = 137 gal/ 5 min.			
		③	Interval: d. 48.5 to 100.5 (BDH) H2O Press.: (48.5 + 17.6(stick up)) x .43 = 28 psi Gage: 0 psi (28 psi total) Take = 235 gal/ 5 min.			
		④	Interval: d. 32.5 to 100.5 (BDH) H2O Press.: 32.5 x .43 = 14 psi Gage: 5 psi (19 psi total) Take = 233 gal/ 5 min.			

END FORM 1836-A

(BY 1110-1-1801)

SPR 1000 OF 1000-1000

PROJECT

RIO GRANDE FLOODWAY
T or C UNIT, N.M.

HOLE NO.
CN-CH-19

Hole No. CN-CH-20

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Southwest		Albuquerque District		of 5 SHEETS	
2. LOCATION (Coordinate or Station)		Cuchilla Negro Creek Dam		10. SIZE AND TYPE OF BIT "R" bbl. (2 3/4" x 3 7/8")		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)	
3. DRILLING AGENCY		Mobile District		NGVD		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-20		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
5. NAME OF DRILLER		J. Trimm		14. TOTAL NUMBER CORE BOXES		7	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN		6.1		16. DATE HOLE		STARTED 3-18-88 COMPLETED 3-23-88	
8. DEPTH DRILLED INTO ROCK		90.8		17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE		96.9		18. TOTAL CORE RECOVERY FOR BORING		62 %	
				19. SIGNATURE OF INSPECTOR		John C. Shaw	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
0			Overburden (Alluvium) Sand, Gravel, Cobbles, & Boulders			Rockbitted to T.O.R. using bentonite mud	
2							
4							
6			Limestone (.25')			Set 4" ccs. to 4' initially	
6.1			Top of Rock			Began Coring w/ R bbl. (2 3/4" x 3 7/8") 6.1	
8			Limestone, hd., mostly sl. wea., f. xln., mod. to hi. frac. Gray Dip: 30°	100		P-1 Time: 10 min Ran 2.0 Fluid: Bent. Rec. 2.0 D.W.R. Loss 0.0 RQD: 60%, U.L. 0.0 Fair 8.1	
10			Open frags., irr. red clay between, mod. wea.			CD: 8.1	
10.9			Limestone, mod. hd., hi. wea., st., intensely frac. Brown	100	Box	P-2 Ran 3.9 Rec 3.9 Loss 0.0 U.L. 0.0 Time: 17 min. Fluid: Bent, D.W.R. Act.: Smooth RQD: 26%, Poor CD: 12.0 12.0	
12			Highly Weathered to De- composed Zone: Lime- stone & shale decom- posed to zones of v. soft red. brown, sl. cal. clay interbdd. w/ fri. to mod. hd. shaly, cal. rock (hi. wea.). Core readily breaks into shattered frags. when handled. Reddish Brown to Tan Dip: 30°-45°	0	7	P-3 Fluid: Bent. Ran 2.4 D.W.R. Rec. 0.0 Act.: Smooth Loss 2.4 RQD: 0% U.L. 2.4 V. Poor Time: 6 min CD: 14.4 14.4	
14							
16							
18				100		P-4 Ran 3.6 Rec 3.6 Loss 0.0 U.L. 0.0 Time: 17 min Fluid: Bent., D.W.R. Act.: Smooth RQD: 0% V. Poor CD: 18.0 18.0	
20			Num. core loss zones.			P-5 Ran 2.9 Rec 1.8 Loss 1.4 U.L. 1.4 Time: 15 min.	

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-20	
PROJECT			INSTALLATION		SHEET	
Cuchillo Negro Ck.			Albuquerque District		2	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV. ERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant)
a	b	c	d	e	f	g
	20		Highly wea. zone...			RQD = 0%, V. Poor
			(cont.)			CD = 20.9 20.9
	22			64		P-6 Ran 2.8 RQD = 0%, Rec 1.8 v. Poor Loss 1.0 U.L. 1.0 Time: 14 min. Fluid: Bent., partial loss CD = 23.7
	24			45	Box 2	P-7 Ran 3.3 Rec 1.5 Loss 1.8 U.L. 1.8 Time: 10 min Fluid: Bent., Part. Loss RQD = 0%, V. Poor CD = 27.0 27.0
	26			6	7	P-8 Ran 1.7 Time: 6 min Rec 0.1 RQD = 0% Loss 1.6 v. Poor CD = 28.7 28.7
	30			43		P-9 Ran 4.9 Rec 2.1 Loss 2.8 U.L. 2.8 Time: 11 min Fluid: Bent., Part. Loss Act.: Smooth RQD = 0%, V. Poor 4" cas lowered to 30' CD = 33.6 33.6
	34.1		Limestone, mod. hd., hi. wea., st., sl. cal. to cal, intensely frac., w/ inter- beds of hi. wea. to de- composed rock. Occ. v. soft clay zones. Significant core loss. Red. Brown to Tan	95	Box	P-10 Ran 4.0 Rec 3.8 Loss 0.2 U.L. 0.2 Time: 7 min. Fluid: Bent., Part. Loss RQD = 0%, V. Poor CD = 37.6 37.6
	38				3	P-11 Ran 6.3 Rec 3.4 Loss 2.9 U.L. 2.9 Time: 18 min. Fluid: Bent. Part. Loss Act.: Smooth RQD = 6%, V. Poor
	40			54	7	
	42					
	44		- Jt, ti., Fe st., ss°			CD = 43.9 43.9

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-20		
PROJECT		INSTALLATION		SHEET 3 OF 3 SHEETS		
Cuchillo Negro Ck.		Albuquerque District				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant) g
44			Limestone ... (cont.) Solution face, approx. vert.	73		P-12 Ran 4.8 Rec. 3.5 Loss 1.3 U.L. 1.3 Time: 15 min. Fluid: Bent. Part. Loss Act: Smooth RQD = 8%, V. Poor
46			Decomposed to Clay, v. soft, w/ relic bdd. structure, 45°, red. br.			
48			chert, v. hd., wea., hi. pitted			
48.9						CD: 48.9 48.9
50			Limestone, hd.-v. hd., sl. wea., f. xln, fos. w/ occ bdd ptgs. Gray Dip: 20°-30° Bdd Ptgs., ti., 25°-30°	98	Box 4	P-13 Ran 5.0 Rec. 4.9 Loss 0.1 U.L. 0.1 Time: 52 min. Fluid: Bent., Part. Loss Act: Smooth RQD = 72%, Good
52			Bdd Ptg., op., hi. wea. to decomp shale & red. br. clay between frac. Bdd Ptg., ti., irr., L/a			
53.7						CD: 53.7 53.7
54			Fragmented Limestone, hi. wea., mod. hd., fos., Fe st w/ some clay Red Brown			
55.1			Limestone, hd., sl. to mod. wea. Gray & Tan		7	P-14 Ran 5.7 Rec. 2.0 Loss 3.7 U.L. 3.7 Time: 5 min. Fluid: Bent., 100% circ. loss Act: Rough RQD = 8%, V. Poor
55.7			Clay Filled Cavity (depths may not be exact)	35		
56						
58						
59.4						CD: 59.4 59.4
60			Limestone, mod. hd. to hd., mod. wea. Lt. Gray		Box	P-15 Ran 5.0 Rec 2.8 Loss 2.2 U.L. 2.2 Time: 12 min. Fluid: Bent., 50% - 100% Loss Act: Rough RQD = 18%, V. Poor
60.6			Decomposed Zone: Limestone decomposed to v. soft silty clay Lt. Tan Dip: 30° 2.2 ft Core Loss	56	5	
62						
63.2			Limestone, hd., sl. wea., hi. to intensely frac. Gray		7	
64			Intensely frac. zones			CD: 64.4 64.4
66					65.1 - Wrap #1 65.9	P-16 Ran 5.0 Rec 4.2 Loss 0.8 U.L. 0.8 Time: 30 min. Fluid: H ₂ O, 100% Loss Act: Rough RQD = 32%, Poor
66.4			Hi. wea., Fe st.			
67.3			Clay, v. soft, red. brown	84		
68			Limestone, hd., sl. wea. Gray			

ENG FORM 1836-A

(REV 1110 1-1801)

GPO 1000 OF - 620 - 603

B-119

PROJECT

Cuchillo Negro Ck

HOLE NO

CN-CH-20

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-20		
PROJECT		INSTALLATION		SHEET #		
Cuchillo Negro Ck.		Albuquerque District		OF 5 SHEETS		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering etc., if significant)
a	b	c	d	e	f	g
68.2			Limestone ...			
			Decomposed Zone : Limestone/shale(?) decomposed to silty clay, soft to v. soft, sl. cal. to cal., w/ relic bdd. structure. Occ. mod. hd. less wea. zones. Hi. to int. frac. Red. Brown to Yellow Tan Dip: 30°-40°	50	Box 5 of 7	CD=69.4 69.4 P-17 Ran 5.0 Rec. 2.5 Loss 2.5 U.L. 2.5 Time: 10 min. Fluid: H ₂ O, 100% Loss Act.: Rough RQD = 0%, V. Poor
70						
72						
74			Note: Core becomes indurated after drying in the sun.			CD=74.4 74.4
76			Vert. Jt., st., fragmented Jt., ti, slick, 60° (Extensive Core Losses)	25		P-18 Ran 4.7 Rec. 1.2 Loss 3.5 U.L. 3.5 Time: 18 min. Fluid: H ₂ O, 100% Loss Act.: Rough RQD = 0%, V. Poor
78						
80					Box	CD=79.1 79.1
82				47	6 of	P-19 Ran 5.3 Rec. 2.5 Loss 2.8 U.L. 2.8 Time: 5 min. Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 8%, V. Poor
84					7	CD=84.4 84.4
86.1			Limestone, mostly hd., sl to mod. wea., mod. to hi. frac., w/ occ. hi. wea., soft zones. Gray Dip: 35°-40° Hi. wea. decomp. seam, clayey Hi. wea. to decomp. zone, soft, red. brown	72		P-20 Ran 5.0 Rec. 3.6 Loss 1.4 U.L. 1.4 Time: 16 min. Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 38%, Poor
88						CD=89.4 89.4
90				84	90.2 Wrap # 2 91.0	P-21 Ran 5.0 Rec. 4.2 Loss 0.8 U.L. 0.8 Time: 9 min. Fluid: H ₂ O, 100% Loss
92						

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-20	
PROJECT			INSTALLATION		SHEET 5 OF 5 SHEETS	
Cuchillo Negro Ck.			Albuquerque District			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
92.2			Decomposed Zone: Limestone shale(?) decomposed to v. soft silty clay, sl. cal. to non cal. w/ relic bdd. structure. Red Brown Dip: 30°-40° 2.0' core loss	84	Box 7	RQD = 34%, Poor
94					of	CD-94.4 94.4
95.6			Limestone, hd., sl. wea., hi. frac.	52	7	P-22 RQD = 20% Ras 2.5 Rec. 1.3 V. Poor Loss 1.2 U.L. 1.2 Time: 7 min.
96.9			Gray w/ Tan			CD-96.9 96.9
			B.O.H			
98			Pressure Tests (HQ Single Packer)			
			① Test Interval: 52.5 to 96.9 (B.O.H.) H ₂ O Press: 52.5 x .43 = 23 psi Gage: 0 psi (Bypass valve closed... all H ₂ O in hole) Take = 151 gal./5 min (Max pump output @ med. throttle)			
			② Test Interval: 30.0 - 96.9 (B.O.H.) H ₂ O Press: 30.0 x .43 = 13 psi Gage: 0 psi (Bypass valve closed... all H ₂ O in hole) Take = 145 gal./5 min. (Max pump output @ med. throttle)			

Hole No. CN-CH-21

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Southwest		Albuquerque District		1 OF 7 SHEETS	
2. LOCATION (Coordinates or Section)		Cuchillo Negro Creek Dam		10. SIZE AND TYPE OF BIT "R" Bbl & HQ Wireline			
3. DRILLING AGENCY		Rt. Abutment of RCC Spillway &		11. DATUM FOR ELEVATION SHOWN (FSD or MSL)		NGVD	
4. HOLE NO. (As shown on drawing title and file number)		Mobile District		12. MANUFACTURER'S DESIGNATION OF DRILL		Failing 3/4	
5. NAME OF DRILLER		J. Trimm		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE		J. Trimm		14. TOTAL NUMBER CORE BOXES		12	
7. THICKNESS OF OVERBURDEN		7.6		15. ELEVATION GROUND WATER		Dry to 131' (fell in)	
8. DEPTH DRILLED INTO ROCK		129.8		16. DATE HOLE		STARTED 3-29-88 COMPLETED 4-2-89	
9. TOTAL DEPTH OF HOLE		137.4		17. ELEVATION TOP OF HOLE			
				18. TOTAL CORE RECOVERY FOR BORING		89 %	
				19. SIGNATURE OF INSPECTOR		John C. Shaw	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OF SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
0	0		Overburden			Rockbitted to of Rock using bentonite mud	
2	2						
4	4						
6	6					Set 4" cas. to 7.6	
7.6	7.6		Top of Rock			Began Coring w/ "R" Bbl (2 3/4" x 3 7/8") 7.6	
8	8		Limestone, hd, sl. wea. Gray			P-1 Ran 3.5 Rec 3.5 Loss 0.0 U.L. 0.0 Time: 18 min Fluid: Bentonite, D.W.R. Act.: Smooth RQD = 47%, Poor	
8.6	8.6		Cal. Shale, mod. hd, hi. wea., friable Brown	100	Box	CD=11.1 11.1	
9.3	9.3		L.S. hd, sl. to mod wea. gray				
10	10		Decomposed Zone: Shale, decomposed to soft to v. soft clay, cal. to sl. cal., w/ relic bdd. structure. Core falls apart when handled. Red Brown to Tan Dip: 30°-35° Becomes indurated when sun dried	100	1	P-2 Ran 4.8 Rec 4.8 Loss 0.0 U.L. 0.0 Time: 27 min. Fluid Bent., D.W.R. Act.: Smooth RQD = 0%, v. Poor	
12	12						
14	14				12		
16	16					CD=15.9 15.9	
17.5	17.5		Dk Red Shale			P-3 Ran 3.4 Rec 2.7 Loss 0.7 U.L. 0.7 Time: 51 min. Fluid: Bent., D.W.R. Act.: Smooth RQD = 35%, Poor 19.3	
18	18		Limestone, hd, sl. wea., hi. frac. w/ num. irr., shaly inclusions. Gray w/ red	79	Box	CD=19.3 19.3	
19.7	19.7		Jt., op. wea., clayey, 70°		2		
20	20						

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-21	
PROJECT			INSTALLATION		SHEET 2 OF 7 SHEETS	
Cuchillo Negro Ck.			Albuquerque District			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering etc., if significant) g
	20		Cal. Shale, mod. hd., mod to hi. wea., fri., int frac. to shattered. Red. Brown			P-4 Ran 4.9 Ran 4.8 Loss 0.0 U.L. 0.0 Time: 45 min. Fluid: Bent, DWR Act: Smooth RQD = 71%, Fair
	21.0		Gradational		20.9	
			Argil. Limestone, mod. hd. to hd., unwea. w/ red shale incls. Gray	100	wrap #1	
	22				21.9	
	22.7		Limestone, hd.-v. hd., sl. wea., hi. frac., gray Dip: L/a		Box	
	24		Vert. Jt., partially hld. to op. wea.		2	CD = 24.1 24.1
	24.9		Hi. wea. zone w/ v. soft clay			P-5 Ran 4.5 Rec 4.5 Loss 0.0 U.L. 0.0 Time: 37 min. Fluid: Bent, D.W.R. Act: Smooth RQD = 51%, Fair
	26		Cal. Shale, mod. hd., sl. wea. w/ limestone lenses. Num bdd pty. Red. Brown w/ gray & green. Dip: 10°-25°	100	of	
	27.2				12	
	28		Shaly Limestone, mod. hd to hd, sl. wea., fos., interlensed.			CD = 29.6 29.6
			Gray & Red. Brown Dip: 10°-20°		Box	
	30		Bdd. Pty., op., L/a	89	3	P-6 HQ Wireline Ran 2.7 Fluid: Bent Rec 2.4 DWR Loss 0.3 U.L. 0.3 Time: 22 min. RQD = 59%, Fair
	31.3		Intensely frac w/ v. soft shaly seam @ 31' (0.3 U.L.)			CD = 31.3
	32		Limestone, hd.-v. hd., unwea., f. xln., fos., stglo., med to thick bdd w/ occ. chert lenses & shale lam.		Wrap #2	P-7 Ran 10.0 Rec 10.0 Loss 0.0 U.L. 0.0 Time: 55 min. Fluid: H ₂ O, DWR Act: Smooth RQD = 100%, Excellent
			Dip: Irr., L/a		of	
	34		Bdd. Pty., op., L/a		12	
	36		Bdd Pty., ti., irr., L/a	100		
	37.7					
	38		Interlensed Limestone & Cal. Shale, mod. hd.-hd., unwea., hi. fos. Dark & Lt. Gray Dip: 15°-25°, irr.		Box	CD = 41.3 41.3
	40				4	
	42		L/a Jts., ti	98	of	
	44				12	

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-21		
PROJECT Cuchillo Negro Ck.		INSTALLATION Albuquerque District		SHEET 3 OF 7 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
44.4	44.4		Cal. Shale, mod. hd., mostly unwea., hi. fos., w/ occ. sl. staining. Readily breaks along bdd. & cal. hld. jts. Greenish Gray w/ occ. red tint Dip: 15°-30°	98	Box 4 46.3 Wrap #3 47.0	P-8 Ran 10.0 Rec. 9.8 Loss 0.2 U.L. 0.2 Time: 58 min. Fluid: H ₂ O, DWR Act.: Smooth RQD = 35%, Poor
49.3	50		Shale, mod. hd., mod. to hi. wea., intensely frac. to shattered, cal. to non cal., w/ v. soft clay seam. Greenish Gray w/ red tint clay seam Open Bdd. Ptas. Irr wea. surface, cal.			CD = 51.3 51.3
52.2	52		Jt. op., cal. on faces, sl wea. 75° (Lost circulation)		Box 5	P-9 Ran 10.0 Rec. 9.7 Loss 0.3 U.L. 0.3 Time: 75 min Fluid: H ₂ O, 100% circ. loss @ 53
54	54		Limestone, mod hd. to hd, unwea., fos., massive w/ num nodular inclusions. Gray Dip: Indistinct	97	of 12	Act.: Smooth RQD = 84%, Good
58	60		2 Parallel Jts., cal. hld. 55°		58.6 Wrap #4 59.7	CD = 61.3 61.3
62.8	62		Shale, mod. hd., mod. wea., stained, intensely frac. Greenish Gray to Red	97	Box 6	P-10 Ran 4.6 Rec. 4.4 Loss 0.2 U.L. 0.2 Time: 38 min. Fluid: H ₂ O, >50% Act.: Smooth Loss
63.9	63.9		Limestone, hd., unwea., fos., shaly, w/ occ nodular zones. Gray Dip: Err. L/A		of	RQD = 67%, Fair
66	66		Bdd. Pty. op., L/A		12	CD = 66.9 66.9 P-11 Ran 4.9 Rec 4.8 Loss 0.1 U.L. 0.1 Time: 41 min.
68	68					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-21		
PROJECT		INSTALLATION		SHEET 4 OF 7 SHEETS		
Cuchillo Negro Ck.		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
68	68.3		Interbdd. Cal. Shale & Limestone, mod. hd. to hd, unwea., thin to med. bdd, w/ nodular L.S. zones. Dk Gray & Gray Dip: Irr., L/a Bdd Ptgs, op, L/a	98	69.9 Wrap #5	Fluid: H ₂ O, >50% Loss Act.: Smooth RQD = 78%, Good CD = 70.8 70.8
70					Box	P-12 Ran 10.2 Rec. 10.0 Loss 0.2 U.L. 0.2 Time: 76 min Fluid: H ₂ O, >50% Loss Act.: Smooth RQD = 75%, Good
72					7	
72.5			Shale, mod. hd., unwea., sl. cal. to non cal., hi to intensely frac., w/ occ. h/a cal. hld jts. Dk. Red. Brown Dip: L/a to indistinct Soft, friable seam (0.1)	98	74.5 Wrap #6 75.2	
74						
76					of	
76.3			Limestone, hd - v. hd, unwea., f to micro xln., mostly thick bdd., fos., w/ occ. thin beds & lam. of shale. Also cal hld. jts. & frags. Gray Dip: Irr., 15°-30° Bdd Ptgs., ti., L/a		12	CD = 81.0 81.0
78						
80						
82			Bdd. Ptg, ti., shaly, L/a			P-13 Ran 9.3 Rec. 8.1 Loss 1.2 U.L. 1.2 Time: 70 min. Fluid: H ₂ O, 100% H ₂ O Loss @ 84.3 Never regained Act.: Rough 84 - 85 RQD = 64%, Fair
84			Shaly Limestone		Box	
84.0					8	
85.2			Cavity (clay filled?) 1.2' core Loss	87		
86			Intensely frac. along h/a op. jt., sl st.		Wrap #7	
88					59.0	
90					of	
92			Jt., cal. hld., 70°		12	CD = 90.3 90.3 P-14 Ran 4.8 Rec 4.8 Loss 0.0 U.L. 0.0

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-21		
PROJECT		INSTALLATION		SHEET 5 OF 7 SHEETS		
Cuchillo Negro Ch.		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
92			Limestone... (cont.)	100		Time: 35 min Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 85%, Good
			Bdd. Ptg., op., shaly, L/a			
94					Box	CD = 95.1 95.1
96			Jt, ti., cal hld., 70°		9	P-15 Ran 6.1 Rec 5.4 Loss 0.7 U.L. 0.7 Time: 50 min. Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 66%, Fair
			Bdd. Ptg., op., irr.	89		
98					98.8	
			Num shale lam. & incl.		Wrap # 8	
99.7			0.7' U.L. Probably soft wea. shale bed		99.7	
100.4					of	CD = 101.2 101.2
102			Bdd Ptg., op., 25°		12	P-16 Ran 9.9 Rec 9.9 Loss 0.0 U.L. 0.0 Time: 72 min. Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 93%, Excellent
104			" " ti. "			
			" " op., shaly, L/a			
			Irr. frac., ti.	100		
106			2 Bdd. Ptg., op., shaly, L/a		106.3	
					Wrap # 9	
108			Jt., op., cal crystals on faces, 75°		107.5	
					Box	
110					10	
			Bdd Ptg., op., shaly, L/a		of	CD = 111.1 111.1
112			Cal. hld. Jt., 0.2' thick band sl. wuggy, 75°-80°		12	P-17 Ran 4.4 Rec 4.2 Loss 0.0 U.L. 0.0 Time: 35 min. Fluid: H ₂ O, 100% Loss Act.: Smooth RQD = 84%, Good
			Shale bed, sl. wea., cal, fri. Gray	95		
114						
116			Bdd. Ptg., op., shaly, L/a			CD = 115.5 115.5

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-21		
PROJECT		INSTALLATION		SHEET 6 OF 7 SHEETS		
Cuchillo Negro Ck.		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering etc., if significant)
a	b	c	d	e	f	g
	110		Limestone... (cont)		Box	P-18 Ran 5.7 Rec 5.5 Loss 0.2 U.L. 0.2 Time: 48 min Fluid: H ₂ O, 100% Loss Act: Smooth RQD = 99%, Excellent
	118			96	11	
	120				117.4 Wrap #10	
	122		Jt., ti., h/a, solution face			CD = 121.2 121.2
	122.4		Shale, soft to v. soft, hi. wea to decom., intensely frac, cal, mostly friable.	87	of	P-19 Ran 2.3 Fluid: H ₂ O Rec 2.0 100% Loss Loss 0.3 RQD: 48% U.L. 0.3 Time 9 min Poor CD: 123.5 123.5
	124		Red Brown to Gray		12	
	126		Less weathered		124.9 Wrap #11	
	128		Note: Becomes indurated when sun dried		125.6	
	130		Clayey, v. soft, w/ mod hd frags		126.7 Wrap #12	
	132				127.3	
	134		Cavity (Rod Drop) Open or muck filled (?)	30	Box	RQD = 13% v. Poor
	136				12	* Note: Rod Drop from 127.3 to 137.0
	138				of	
	140				12	
	137.0		Shale, soft, fri, hi. wea. to decom.			CD: 137.4 137.4
	137.4		* Red Brown B.O.H.			
	138					
	140					

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-21	
PROJECT Cuchillo Negro Ck.			INSTALLATION Albuquerque District		SHEET 7 OF 7 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Pressure Tests: (NA single Packer)			
		①	Test Interval: 117.5 to 137.4 (BOH) H ₂ O Press = 117.5 + 8.6 stick up x .43 = 54 psi Gage = 0 psi Take = 138 gal/min			
		②	Test Interval: 93.8 to 137.4 (BOH) H ₂ O Press = 93.8 x .43 = 40 psi Gage = 2-3 psi Total H ₂ O press = 43 psi Take = 159 gal/min			
		③	Test Interval: 70.5 to 137.4 (BOH) H ₂ O Press = 70.5 + 5.5 stick up x .43 = 33 psi Gage = 2-3 psi Total H ₂ O Press = 36 psi Take = 129 gal/min			
		④	Test Interval: 43.6 to 137.4 (BOH) H ₂ O Press = 43.6 x .43 = 19 psi Gage = 2-3 psi Total H ₂ O Press = 22 psi Take = 239 gal/min			

Hole No. CN-CH-22

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Southwest		Albuquerque District		1 OF 5 SHEETS	
2. LOCATION (Coordinates of Station)		Cuchillo Negro Creek Dam		10. SIZE AND TYPE OF BIT "R" Bbl & HQ Wireline			
3. DRILLING AGENCY		Mobile District		11. DATUM FOR ELEVATION SHOWN (FSL or MLL)		NGVD	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-22		12. MANUFACTURER'S DESIGNATION OF DRILL		Failing 3/4	
5. NAME OF DRILLER		J. Trimm		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		8	
7. THICKNESS OF OVERBURDEN		24.8		15. ELEVATION GROUND WATER		d. 90.9 4-8-88	
8. DEPTH DRILLED INTO ROCK		76.2		16. DATE HOLE		STARTED 4-4-88 COMPLETED 4-6-88	
9. TOTAL DEPTH OF HOLE		101.0		17. ELEVATION TOP OF HOLE		98	
				18. TOTAL CORE RECOVERY FOR BORING		98	
				19. SIGNATURE OF INSPECTOR		John C. Shaw	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
	0		Overburden:			Rockbitted to Top of Rock using Bentonite mud.	
	2		Silt, Sand, Gravel & Cabbles				
	4		Gray				
	6						
	8						
	10						
	12						
	14						
	16						
	18						
	20						
				5 1/2" Rockbit	Not Sampled		

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-22		
PROJECT		INSTALLATION		SHEET 2 OF 5 SHEETS		
Cuchillo Negro Ck		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	20					
	22					
	24					Set 6" cas. to 7.2 Set 4" cas to 24.9
	24.8		Top of Rock			Began Coring w/ R Bbl. (2 3/4" x 3 7/8")
	26		Limestone, hd, unwea. Gray Dip: 15°-20° Bdd Ptg., ti., 15°	100	Box 1	P-1 Ran 4.0 Rec 4.0 Loss 0.0 U.L. 0.0 Time: 36 min. Fluid: Bentonite, Part. Loss Act: Smooth RQD = 53%, Fair
	26.8		Cal. Shale & Nodular Limestone, mod. hd. to hd, sl. wea., h. to intensely frac. Red Br & Gray Dip: irr. Intensely frac. clayey			CD = 28.8 28.8
	28		Limestone, hd to v. hd, unwea., f. xln., fos., stylo, med to thick bdd., w/ num shale lam. & shaly zones. Gray Dip: irr, wavy, 15°-25°	100	30-1 Wrap #1	P-2 Ran 4.0 Rec 4.0 Loss 0.0 U.L. 0.0 Time: 39 min. Fluid: Bentonite, DWR Act: Smooth RQD = 83%, Good
	28.5		Num Red Shale lam, wavy, irr. Bdd Ptg., sl wea., ti., irr, 35° " " ti., shaly, 20°		31-1 of	CD = 32.8 32.8
	30				8	P-3 HQ Wireline Ran 8.3 Rec 8.3 Loss 0.0 U.L. 0.0 Time: 62 min. Fluid: H ₂ O, DWR Act: Smooth RQD = 86%, Good
	32					
	34		Chert lens, v. hd.			
	36			100	Box 2	
	38		Bdd. Ptg., ti., 15°-20°			
	40				39.5 Wrap #2	
	41.2				40.5	CD = 41.1 41.1
	42		Very shaly		of	
	44				8	

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-22	
PROJECT			INSTALLATION		SHEET 3 OF 5 SHEETS	
Cuchillo Negro Ck.			Albuquerque District			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
44	44.5		Limestone... (cont.) Bdd. Ptgs., op., st., 15°-20° Gradational contact			P-4 Ran 10.0 Rec. 10.0 Loss 0.0 U.L. 0.0 Time 58 min Fluid: H ₂ O, DWR Act.: Smooth RQD = 65%, Fair
	46		Predominately Cal. Shale, mod. hd., mostly unwea., occ. Fe st., fos., highly to intensely frac. along bdd. Greenish Gray Dip: 15°-20°	100	3	
	48		Argil. Limestone beds Bdd. Ptgs., op., sl. st., 15°-20° Jt., cal. hld., 50° Jt., ti., 80° Bdd. Ptgs., ti., 15°-20° Jt., op., 35°		8	
	50				47.9- Wrap #3	
	51.1		10' core Loss Zone. Probably H. wea. to decomp. shale.		50.9	CD = 51.1 51.1
	52				52.6	
	52.1		Shale, soft to mod. hd., mod. wea., Fe st., sl. cal. to non cal., intensely frac., w/ occ. slicks (40°-45°) Greenish Gray to Tan Dip: 20°-25°		Wrap #4 53.3	P-5 Ran 10.0 Rec. 9.0 Loss 1.0 U.L. 1.0 Time: 65 min Fluid: H ₂ O, DWR Act.: Smooth RQD = 47%, Poor
	54					
	55.2					
	56		Limestone, hd to v. hd, mostly unwea., f. xln. to micro xln., nodular zones, fos., mostly thick bdd w/ num. shale lam. & w/ irr. shaly inclusions. Occ. op. to ti. bdd. ptgs. & cal. hld. jts. & trace. Gray w/ occ. red tint Dip: 15°-20°	90		
	58				Box 4	
	60		Bdd. Ptgs., ti., irr. Jt., op., cal., st., 65°		of 8	CD = 61.1 61.1
	62					P-6 Ran 5.9 Rec 5.8 Loss 0.1 U.L. 0.1 Time: 39 min Fluid: H ₂ O, DWR Act.: Smooth RQD = 78%, Good
	64		Bdd. Ptgs., ti., 15°-20°	98	63.4 Wrap #5 64.5	
	66		" " " " "			
	66.3					CD = 67.0 67.0
	67.5		V. shaly, hi. fos., nodular l.s. w/ reddish shale matrix, hi. to int frac., orange staining			
	68		op. frac., irr., sl. wea., L/a			

BNG FORM 1036-A

(R 1110-1-1801)

GPO 1000 OF - 520-513

PROJECT

Cuchillo Negro Ck.

HOLE NO

CN-CH-22

PROJECT			ELEVATION TOP OF HOLE		Hole No. CN-CH-22	
Cuchillo Negro Ck.			INSTALLATION		SHEET 4 of 5 SHEETS	
Albuquerque District						
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering etc., if applicable)
a	b	c	d	e	f	g
	68		Intensely frac., shaly, op, orange st. Limestone... (cont.)	98	Box 5	P-7 Ran 4.1 Rec 4.0 Loss 0.1 U.L. 0.1 Time: 29 min Fluid: H ₂ O, DWR RQD = 78%, Good CD = 71.1 71.1
	70		Bdd. Ptg., op., irr., orange st., L/a.		of 8	
	72					
	72.9					
	74		Bdd. Ptg., op., irr., L/a Cal. hld frac., sl. vuggy	73.9	Wrap #6	P-8 Ran 9.9 Rec 9.7 Loss 0.2 U.L. 0.2 Time: 105 min Fluid: H ₂ O, DWR Act: Smooth RQD = 87%, Good
	76		Predominately Cal Shale, mod hd - hd, w/ thin beds, lenses, & lam. of limestone Grayish Brown & Gray Dip: 15°-20°	unwea. 74.8		
	77.0		Shale, mod. hd, sl. wea., sl. cal to non cal., hi. to int. frac. Brown Dip: L/a	98		
	78.0		Limestone, hd - vhd., unwea., f. xln., massive, w/ occ. shale lam. Lt Gray Dip: 15°-20°		Box 6	
	80		chert lens			
	82		Jt, cal hld., 70° Bdd, op., st., 15°-20°	81.0	Wrap #7	P-9 Ran 10.1 Rec 10.1 Loss 0.0 U.L. 0.0 Time: 97 min. Fluid: H ₂ O, Partial Loss from 89' Act: Smooth RQD = 93%, Excellent
	84		Bdd. Ptg., op., st., irr.		of 8	
	85.7		Bdd Ptg., ti., 30°			
	86		Limestone, hd, unwea., f. xln., fos., thick bdd. Gray Dip: 15°-20°	100		
	88					
	90		Jt., op., wea., st., vuggy, cal., 60°-65°		Box 7	
	92		Bdd. Ptg., op., 15°		of 8	CD = 91.1 91.1

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-22	
PROJECT			INSTALLATION		SHEET 5 OF 5 SHEETS	
Cuchillo Negro Ck.			Albuquerque District			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	92		Limestone... (cont.)		Box 7	P-10 Ran 9.9 Rec 9.9 Loss 0.0 U.L. 0.0
	94		Bdd Pty., op, 15°		94.4 Wrap #8	Time: 110 min. Fluid: H ₂ O, partial loss
	96		" " " "	100	95.5	Act: smooth RQD = 88%, Good
	98		Bdd Pty., ti, 15°-20°		Box 8	
	100				of 8	
	101.0					CD = 101.0 101.0
	102		Pressure Tests (No Single Packar)			
			① Test Interval: 87.5 to 101.0 (BOH) H ₂ O Press: $[87.5 + 8.6 (\text{stick up})] \times .43 = 41 \text{ psi}$ Gage: 5 psi Total H ₂ O Press. = 46 psi Take = 35 gal/5 min			
			② Test Interval: 73.5 to 101.0 (BOH) H ₂ O Press: $73.5 \times .43 = 32 \text{ psi}$ Gage: 2.3 psi Total H ₂ O Press = 35 psi Take = 70 gal/5 min.			
			③ Test Interval: 43.8 to 101.0 (BOH) H ₂ O Press: $43.8 \times .43 = 19 \text{ psi}$ Gage: 2.3 psi Total H ₂ O Press = 22 psi Take = 69 gal/5 min.			

Hole No. CN-CH-23

DRILLING LOG		DIVISION	INSTALLATION		SHEET	
1. PROJECT		SWD	Albuquerque District		1 OF 5 SHEETS	
2. LOCATION (Coordinate or Station)		CUCHILLO NEGRO CREEK DAM	10. SIZE AND TYPE OF BIT RANGE/INCH/INCH		11. DAY/OF ELEVATION SHOWN (TUN or MSL)	
3. DRILLING AGENCY		MORILE DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-23	14. TOTAL NUMBER CORE BOXES		15. ELEVATION GROUND WATER	
5. NAME OF DRILLER		TRIMM	16. DATE HOLE		17. ELEVATION TOP OF HOLE	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.	18. TOTAL CORE RECOVERY FOR BORING		19. SIGNATURE OF INSPECTOR	
7. THICKNESS OF OVERBURDEN		9.8	20. DATE HOLE		21. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		90.7	22. TOTAL CORE RECOVERY FOR BORING		23. SIGNATURE OF INSPECTOR	
9. TOTAL DEPTH OF HOLE		100.5	24. DATE HOLE		25. ELEVATION TOP OF HOLE	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
			OVERBURDEN WITH GRAVEL, COBBLES AND BOULDERS.			MIXED GASTROITE - ROLLERBT 6" d.a. D.O. - 9.8 SET 6" CASING TO depth 6.8'
	9.8		T.D.R.			Begin (only at P. Barrel) & USED D.A. BT. USING TRIM MIXTURE OF GASTROITE
	12.0			100	B O X	Pull-1 d-9.8-12.0 RAD 2.2 REC 2.2 U.L. 0.0 Water Return 100% Color Tan Hyp. Pressure 140 PSI Time 8 min Drill Action Smooth Set 12.0' of H.O. casing w/d.a. size 7/8" d. 10.7
	16.6			100	1	Pull-2 d-12.0-16.6 RAD 4.6 REC 4.6 U.L. 0.0 Water Return 100% Color Tan Hyp. Pressure 160 PSI Time 37 min Drill Action Smooth
	20.0			96	9	Pull-3 d-16.6-20.0 RAD 5.0 REC 4.8 U.L. 0.2 Water Return 100% Color Tan Hyp. Press. 160 PSI Time 47 min Drill Action Smooth

ENG FORM 1836
MAR 71PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

B-136

PROJECT
CUCHILLO NEGRO CREEK DAMHOLE NO.
CN-CH-23

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CAJ-CH-23	
PROJECT CUCUILLO NEGRO CREEK DAM			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 2 OF 5 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering etc., if significant) g
	21.4				B D X	
				100	2	Pull-4 d. 21.4-26.1 Run 4.7 Rec 4.7 U.L. 0.0 Water Return 100% Color Tan Hyd. Press. 180 PSI Time 6.5 min Drill Action Smooth
	26.1				0/	
				100	9	Note: Core Sample Missing Beginning of Run. Run is 5' casing to 26.1 and Fixed Core sample. Pull-5 d. 26.1-31.0 Run 4.6 Rec 4.6 U.L. 0.0 Water Return 100% Color Tan Hyd. Press. 160 PSI Time 3.8 min Drill Action Smooth
	31.0				0 C X	
				100	3	Pull-6 d. 31.0-35.8 Run 4.8 Rec 4.8 U.L. 0.0 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 2.8 min Drill Action Smooth
	35.8				0/	
				100	9	Barrel Casing with N.P. wireline drill with 6.00 DIA. BIT Pull-7 d. 35.8-40.3 Run 4.5 Rec 4.5 U.L. 0.0 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 2.5 min Drill Action Smooth
	40.3				B D X	
				100	4	Pull-8 d. 40.3-44.1 Run 3.8 Rec 3.8 U.L. 0.0 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 3.5 min Drill Action Smooth
	44.0					

BNG FORM 1836-A

(BR 1110 1-1801)

GPO 1990 OF - 020-001

PROJECT CUCUILLO NEGRO CREEK DAM

HOLE NO CAJ-CH-23

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-23	
PROJECT			INSTALLATION		SHEET 3 OF 5 SHEETS	
CUCUILLO NEGRO CREEK DAM			Albuquerque District			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	47.1			100	01	Pull-9 d. 46.1 - 47.0 Rat 2.9 Rec 2.9 U.L. 0.0 Water Return 100% Color at B.H. Hyd. Press. 180 PSI Time 25 min. Drill Action Smooth
	47.0			100	9	Pull-10 d. 47.0 - 49.3 Rat 2.3 Rec 2.3 U.L. 0.0 Water Return 100% Color at B.H. Hyd. Press. 180 PSI Time 20 min. Drill Action Smooth
	49.3					Pull-11 d. 49.3 - 60.4 Rat 1.1 Rec 6.4 U.L. 5.7 Water Return 100% - 0% Color at B.H. Hyd. Press. 180 PSI Time 28 min. Drill Action Smooth To 51' marker
	53.0			58	5	WATER LOSS (no return)
	56.7		CAVITY		01	56.7 - 59.6 V. Soft (between) Dr. indication SI Rough
	60.4			85	9	Pulled B.O.N. (W. sh. 100%) Pull-12 d. 60.4 - 70.8 Rat 10.4 Rec 8.9 U.L. 1.5 Water Return 0% Hyd. Press. 180 PSI Time 47 min. Drill Action SI. Weathering Core Loss d. 62.7 - 66.0
	68.0				8	
					0	
					X	

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <u>CAI-CN-23</u>	
PROJECT <u>BUCHILLO NEGRO CREEK DAM</u>			INSTALLATION <u>Albuquerque District</u>		SHEET <u>4</u> OF <u>5</u> SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70.8				6	
					0/	Pull-13 d. 70.8-80.8 RAW 10.0 REC 9.8 U.L. 0.2 Water Return 0% Hyd. Press. 180 PSI Time 5 min Drill Action S. Chattering
				96	9	
					8 0 X	
	80.8				7	
					0/	Pulled B.O.N. (in Wiskers) Pull-14 d. 80.8-85.5 RAW 4.7 REC 4.2 U.L. 0.5 Water Return 0% Hyd. Press. 180 PSI Drill Action Smooth Time 32 min
				99	9	
	85.5					
					100	
					8 0 X	
	90.8					
					8	Pull-15 d. 85.5-90.8 RAW 5.3 REC 5.3 U.L. 0.0 Water Return 0% Hyd. Press. 180 PSI Time 35 min Drill Action Smooth
	92.0					
					8	Pull-16 d. 90.8-100.5 RAW 9.7 REC 9.1 U.L. 0.6 Cont'd

Hole No. CN-CH-24

DRILLING LOG		DIVISION	INSTALLATION		SHEET	
1. PROJECT <i>Cuchillo Negro Creek Dam</i>		<i>Southwest</i>	<i>Albuquerque District</i>		OF 2 SHEETS	
2. LOCATION (Coordinate or Station) <i>38.5 ft East of CN-CH-4</i>		10. SIZE AND TYPE OF BIT <i>R" B61 (2 3/4" x 3 7/8")</i>				
3. DRILLING AGENCY <i>Mobile District</i>		11. DATUM FOR ELEVATION SHOWN (FBN or MSL) <i>NGVD</i>				
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-24</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Failing 314</i>				
5. NAME OF DRILLER <i>J. Trimm</i>		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN DISTURBED <i>0</i> UNDISTURBED <i>0</i>				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES <i>1</i>				
7. THICKNESS OF OVERBURDEN <i>35.1</i>		15. ELEVATION GROUND WATER				
8. DEPTH DRILLED INTO ROCK <i>8.1</i>		16. DATE HOLE STARTED <i>4-7-88</i> COMPLETED <i>4-8-88</i>				
9. TOTAL DEPTH OF HOLE <i>43.2</i>		17. ELEVATION TOP OF HOLE				
		18. TOTAL CORE RECOVERY FOR BORING <i>96 %</i>				
		19. SIGNATURE OF INSPECTOR <i>John C. Shaw</i>				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0		Overburden: Silt, Sand, Gravel, & Cobbles Gray			Rockbitted to Top of Rock using bento- nite mud.
	2					
	4					
	6					
	8					
	10					
	12					
	14					
	16					
	18					
	20					

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. <u>CN-CH-24</u>		
PROJECT <u>Cuchillo Negro Ck.</u>		INSTALLATION <u>Albuquerque Distr.</u>		of 2 SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20		Overburden... (cont.)			
	22					
	24					
	26					
	28					
	30					
	32					
	34					Set 4' cas. to 35.2
	35.1		Top of Rock			Began Coring w/ "R" 861. 35.1
	36		SI wea w/ st. vuggy pkts. Limestone, hd, mostly unwca., f. xln., med. to thick bdd., w/ occ shale lam. Gray Dip: 15°	100	Box	P-1 Ran 1.2 Loss 0.0 UL 0.0 Rec 1.2 Fluid: Bent. CD=36.3 RQD=33%, Poor
	38		Bdd. Ptg., ti., shaly, wavy, L/a	93	1 of	P-2 Ran 4.6 Rec 4.3 Loss 0.3 U.L. 0.3 Time: 25 min. Fluid: H ₂ O, 100% Loss @ d 39.3, Never regained
	40		Small Open Cav. Solution along bdd. Lost drill water		39.9 Wrap #1	Act.: Smooth RQD: 87%, Good CD=40.9 40.9
	42		Bdd. Ptg., ti., shaly, 15°	100	2 Wrap #2 42.4	P-3 Ran 2.3 Fluid: H ₂ O Rec 2.3 100% Loss Loss 0.0 RQD=87% U.L. 0.0 Good Time: 12 min. CD=43.2 43.2
	43.2					Hole not press. tested Pulled casing
	44					

ENG FORM 1836-A

(SR 1710-1 1801)

GPO 1980 OF - 628-503

PROJECT

Cuchillo Negro Ck

HOLE NO

CN-CH-24

Hole No. CN-CH-25

DRILLING LOG		DIVISION	INSTALLATION		SHEET 1 OF 4 SHEETS	
1. PROJECT CROWNED NEGRO CREEK DAM		2. LOCATION (Coordinate or Station)	10. SIZE AND TYPE OF BIT R Range 1 & 2 1/2" Dia		11. DAY ON FOR ELEVATION SHOWN (TBM - REL)	
3. DRILLING AGENCY MOBILE DISTRICT		4. HOLE NO. (As shown on drawing title and file number)	12. MANUFACTURER'S DESIGNATION OF DRILL Falling 314-C		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	
5. NAME OF DRILLER J. TRIMM		6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.	14. TOTAL NUMBER CORE BOXES 7		15. ELEVATION GROUND WATER N/E	
7. THICKNESS OF OVERBURDEN 9.6		8. DEPTH DRILLED INTO ROCK 71.6	16. DATE HOLE STARTED 2 MAY 1988 COMPLETED 3 MAY 1988		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE 81.2		18. TOTAL CORE RECOVERY FOR BORING 88	19. SIGNATURE OF INSPECTOR		20. SIGNATURE OF DRILLER	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN GRAVEL AND COBBLE MIX.			MIXED BENTONITE Roller bit 6" dia. 0.0' - 9.6' SET 12.5' OF H.B. CASING WITH DIA. SHOE TO 11.0'
	9.6					Began Coring WITH P' Core!
	12			12	E D X	Pull-1 d-9.6-13.6 RAD 4.0 REC 0.5 U.L. 3.5 WATER RETURN 100% Color 14.0m Hgd. Press. 100-180 PSI Time 16 min Drill Action Smooth STILL USING Bentonite MIX.
	13.6			100	1	Pull-2 d-13.6-16.3 RAD 2.7 REC 2.7 U.L. 0.0 WATER RETURN 100% Color 14.0m Hgd. Press. 180-200 PSI Time 8 min Drill Action Smooth Dropped mud mix - mixed and Thin Bentonite MIX.
	16.3			100	0/	Pull-3 d-16.3-18.2 RAD 1.9 REC 1.9 U.L. 0.0 WATER RETURN 100% Color 14.0m Hgd. Press. 180 PSI Time 9 min Drill Action Smooth
	18.2				7	Pull-4 d-18.2-23.1 RAD 4.9 REC 4.9 U.L. 0.0 Cont'd

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PROJECT
CROWNED NEGRO CREEK DAM
B-143HOLE NO.
CN-CH-25

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. PA-CH-25	
PROJECT PUEBLO NEGRO CREEK DAM			INSTALLATION Albuquerque District		SHEET 2 OF 4 SHEETS	
ELEVATION a	DEPTH 2000 c	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
				100		Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 29 min Drill Action Smooth
	23.1			100	B D X	Pull-5 d. 23.1-27.5 KAD 4.4 Rec 4.4 U.L. 0.0 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 27 min Drill Action Smooth
	27.5			100	2 4 7	Pull-6 d. 27.5-32.5 KAD 5.0 Rec 5.0 U.L. 0.0 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 29 min Drill Action Smooth
	32.5			55	B D X	3rd Gang W.L. 0.0 with line no change stop after 0.9 ft. Pull-7 d. 32.5-35.4 KAD 2.9 Rec 1.6 U.L. 1.3 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 20 min Drill Action Smooth
	35.4			89	3 4 7	Pull-8 d. 35.4-41.2 KAD 5.8 Rec 5.2 U.L. 0.6 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 33 min Drill Action Smooth
	41.2			99	7	Pull-9 d. 41.2-50.5 KAD 9.3 Rec 9.2 U.L. 0.1 Water Return 100% Color LT. Brn Hyd. Press. 180 PSI Time 35 min Drill Action Smooth
	44.0					

ENG FORM 1836-A

(ER 1110 1-1801)

GPO 1980 OF - 538-503

PROJECT

PUEBLO NEGRO CREEK DAM

HOLE NO

PA-CH-25

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CA-CH-25		
PROJECT		INSTALLATION		SHEET 3 OF 4 SHEETS		
CUCHILLO NEBRD CREEK DAM		Albuquerque District				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant)
a	b	c	d	e	f	g
	46.0					
	48				B D X	
	50.5				4	
	52				4	
	54				7	
	56			97		
	58				B D X	
	60.1				5	
	60.9				0	
	62				4	
	64			95	7	
	66					

Full-10 d. 50.5 - 60.1
 RAN 9.6
 REC 9.3
 U.L. 0.3
 WATER RETURN 100% - 75%
 Color LT. Bn
 Hyd. Press 180 PSI
 Time 30 MIN
 Drill Action Smooth

Full-11 d. 60.1 - 60.9
 RAN 0.8
 REC 0.0
 U.L. 0.8
 WATER RETURN 75%
 Color LT. Bn
 Hyd. Press 180 PSI
 Time 13 MIN
 Drill Action Smooth

Full-12 d. 60.9 - 70.0
 RAN 9.1
 REC 8.6
 U.L. 0.5
 WATER Color Creme
 WATER RETURN 65%
 Hyd. Press 180 PSI
 Time 35 MIN
 Drill Action Smooth
 *NOTE - SOFT ZONES between JIS 65.2 - 65.8

Loss 25% H₂O

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CA-CH-25	
PROJECT CUCUILLO NEGRO CREEK DAM			INSTALLATION ALBUQUERQUE DISTRICT		SHEET 4 OF 4 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	68.0				B O X	
	70.0			73	6	Pull-13 d. 70.0-74.5 RAN 4.5 REC 5.3 U.L. 1.2 Water Return 65% Color Cream-Red Hyd. Pressure 180 PSI Time 17 min Drill Action Smooth
	74.5			100	7	Pull-14 d. 74.5-81.2 RAN 6.7 REC 6.7 U.L. 0.0 Water Return 60% Color Cream-Red Hyd. Pressure 180 PSI Time 23 min Drill Action Smooth
	81.2				7	
			F.O.H. WRAP SAMPLES 15- From To 1 15.1 15.8 (CLAY) 2 19.9 21.0 3 26.6 27.5 4 35.8 36.4 5 43.6 44.3 6 48.0 48.9 7 55.7 57.1 8 64.0 65.2 9 75.1 76.2 10 79.6 80.4			40 Chems Left in Hole w/o a shoe

DRILLING LOG		DIVISION	INSTALLATION		SHEET 1 OF SHEETS	
1. PROJECT Cuchillo Negro Crk Dam		SWD	Albuquerque Dist.			
2. LOCATION (Coordinates or Station)			10. SIZE AND TYPE OF BIT HQ wireline			
3. DRILLING AGENCY MOBILE Dist.			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-26			12. MANUFACTURER'S DESIGNATION OF DRILL FALLING 314			
5. NAME OF DRILLER C. Brown			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			14. TOTAL NUMBER CORE BOXES 9			
7. THICKNESS OF OVERBURDEN 9.5			15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK 88.6			16. DATE HOLE STARTED 12-12-88 COMPLETED 12-17-88			
9. TOTAL DEPTH OF HOLE 98.1			17. ELEVATION TOP OF HOLE			
			18. TOTAL CORE RECOVERY FOR BORING 78%			
			19. SIGNATURE OF INSPECTOR James D. McCallum			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0						Rock bitted to 10.6 using Revert. Had to drill to 10.6 to get 138' core barrel in hole
2						
4						
6						
8						
10			Top of Rock			
12			Limestone, hd., sl. wea., f. xln, gray & pink			10.6 P-1 Ran: 5.2 Rec: 4.8 Loss: 0.4 U.L. 0.4 Time: 87 min. Dri. Act: Smooth BWR: brn & gray, slow loss. RQD: 79%
14			Limestone, so to mod hd, hly wea., thick bdd		wrap #1	
16			Clay seam, so. to stiff, calc., rd. br.		wrap #2	
18			bdd ptg, op, wea, clay fld		Box 1 of 9	
20			bdd ptg, op, wea.			
			bdd ptg, op, wea., clay fld, hor.			
			frac, hor.			
			Clay, so. to stiff lam, rd. br.			
			Limestone, hd, sl. to mod wea, thick bdd, w num. calc fld random frags, stylolites, and	100		P-2 Ran: 4.6 Rec: 4.6 Loss: 0.0 U.L. 0.0 Dri Act: Smooth DWR: tan & gray, slow loss Time: 60 min. RQD: 75%

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PROJECT CUCHILLO NEGRO CRK DAM

HOLE NO CN-CH-26

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-26	
PROJECT			INSTALLATION		SHEET 2 OF 5 SHEETS	
Cuchillo Negro Crk Dam			Albuquerque Dist			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV. ERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	20		large calc xls, f. xln, foss, gray & pink			CD 20.4 P-3
	22			45		Ran: 2.1 Rec: 2.0 Loss: 0.1 U.L. 0.1 RQD: 80%
	24	H.B.			Box 2 of 9	CD 22.5 P-4
	26		ptgs, irreg., th and open, st., wea.			Ran: 10 Rec: 9.8 Loss: 0.2 U.L: 0.1 Time: 65 min Drl. Act: Smooth DWR: gray & tan, Slow loss
	28		bdd, op, calc lined, some clay.	98		Hyd press: 200 psi. RQD: 92%
	30		irreg frac, op, st, hor.			
	32		ptg, op, st., s.			
	34		clay seam, soft, red br.			
	36		Limestone, so. to mod hd, mod to highly wea., thick bdd to mas, w/num calc fld fracs, tan & red br.		wrap #3	C.D. 32.4 P-5
	38	H.B.	num slicks. w/ wea. surfaces, clay and calc. clay seam, rd. br.		Box 3 of 9	Ran: 6.5 Rec: 5.6 Loss: 0.9 (left in hole) U.L.: 0.0 Time: 50 min Drl. Act: Smooth DWR: rd. brn, slow loss
	40		ptg, op, st., hor.	86		RQD = 89%
	42		ptg, wea, clayey			
	44		Limestone, v so. to so, hly wea. to decomp, hly frac, tan	73	wrap #4	CD 37.9 P-6
	46					Ran: 2.2 Rec: 1.6 Loss: 0.6 U.L.: 0.6 Time: 40 min DWP: tan, steady loss RQD: 19%
	48		Decomposed zone, L.S. frags and clay, soft, prob. core loss	48		CD 40.1 P-7
	50		Limestone, mod hd to hd, sl. wea., thick bdd, f xln to micro xln w/ large calc. xls, rd br. w/num neds			Ran: 2.5 Rec: 1.2 Loss: 1.3 U.L. 0.0 Drl Act: Smooth DWR: Tan, slow loss RQD: 27%
	52					CD 42.6 P-8 (cont'd)

ENG FORM 1836-A

(NR 1110-1 1801)

GPO 1980 OF - 628 - 805

PROJECT CUCHILLO NEGRO
CRK DAM

HOLE NO CN-CH-26

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-26		
PROJECT		INSTALLATION		SHEET 3 OF 5 SHEETS		
CUCHILLO NEGRO CRK DAM		ALBUQUERQUE DIST				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
44			and lenses of hd, xln, gray l.s.			P-8 Ran: 10.0 Rec: 10.0 Loss: 0.0 U.L.: 0.0 Dri Act: Smooth DWR: tan, slow loss Hyd Press: 200 ps. RGD: 86%
46			jt, t, calc fld, 65° ptg, t, sl. st.			
48			Decomposed zone, rock frags and soft rd. brn. clay.	100	Box 4 of 9	
50			Frac zone, part. calc. hld w/ rd brn clay.			
52			jt, open, w/calc.			
54			It.B			
56			ptgs, op, wea, st, w/ clay & calc. fill.			
58			Num frags w/ clay seams			
60				83	Box 5 of 9	C.D. 52.6 P-9 Ran: 9.6 Rec: 8.0 Loss: 1.6 U.L.: Dri Act: Smooth DWR: tan, constant loss Hyd Press: 250 ps. RGD: 62%
62						
64			Clay / Decom. rock, so. to med. dense, rd. brn.		wrap #5	C.D. 62.2 P-10 Ran: 5.1 Rec: 4.3 Loss: 2.0 U.L.: 0.6 Gain Dri Act: Smooth DWR: tan, lost circ. at cav., rest. ord circ. RGD: 19%
66			Limestone, mod hd, wea., tan	84	Box 6 of 9	C.D. 67.3 P-11
68			cavity			
			L.S., mod. hd, wea., rd. brn & gray			

ENG FORM 1836-A

(REV 1110-1-1001)

GPO 1980 OF - 628 - 603

CUCHILLO NEGRO CRK DAM

HOLE NO CN-CH-26

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-26		
PROJECT		INSTALLATION		SHEET 4 OF 5 SHEETS		
CUCHILLO NEGRO CRK DAM		ALBUQUERQUE, DIST				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	68		Clay seam, soft to stiff, w/ L.S. frags, sl. calc to n. calc, rd. brn. core loss.		Box 6 of 9	P-11 cont'd Ran: 4.9 Rec: 4.0 Loss: 0.9 U.L. 0.0 Time: 25 min. Drl Act: Smooth/fall DWR: rd. brn to tan rapid loss, mxmt. circ. RQD: 46% C.D. 72.2
	70		Limestone, mod. hd, wea., med. to thin bdd, f. xln, rd. brn & gray.	82		
	72		jts, calc. fld, wea. bdd ptg, op, st.			P-12 Ran: 10.0 Rec: 5.6 Loss: 4.4 U.L.: 4.4
	74		Clay seam, soft to stiff, w/ L.S. frags, rd. brn.			Time: 50 min Drl Act: rough/smooth DWR: rd brn & tan, slow loss
	76		Limestone, mod. hd to hd., wea., med to f. xln, mottled rd brn & gray.	56		Hyd press: 90-275 psi RQD: 29%
	78		Fracture zone, intersecting H/A jts (65°), rock frags and soft, sl calc, rd brown clay.		Box 7 of 9	
	80					
	82					C.D. 82.3
	84			48		P-13 Ran 5.2 Rec: 2.5 Loss: 2.7 U.L.: 2.7 Drl Act: Rough DWR: tan, slow loss RQD: 11%
	86					C.D. 87.5
	88		cavity, lost circ. @ 87.9, circ. not restored.		Box 8 of 9	P-14 Ran: 4.6 Rec 2.6 Loss: 2.0 (cav.) U.L. 0.0 LDW@ 87.9 RQD: 42%
	90			57		
	92					C.D. 92.1

ENG FORM 1836-A (SR 1110 1-1801)

GPO 1980 OF - 676 - 603

PROJECT CUCHILLO NEGRO CRK DAM

HOLE NO CN-CH-26

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-26	
PROJECT			INSTALLATION		SHEET 5 OF 5 SHEETS	
CUCHILLO NEGRO CRK DAM			ALBUQUERQUE DIST.			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVER ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
92						P-15
					Box 8 of 9	Ran: 6.0 Rec: 1.8
				30		Loss: 4.2 U.L.: 0.0
94			cavity, no rec., rough dri act, prob. clay & rock filled.			Dri act: rough
						No DWR, no return after d. 87.9
96						RQD: 21%
98					Box 9 of 9	CD 98.1
			• BOH			
			Wrap Samples			
100			No. From To			
			1 12.4 - 13.0			
			2 13.8 - 14.8			
			3 32.4 - 32.8			
			4 37.9 - 38.5			
			5 61.7 - 62.9			

ENG FORM 1836-A

(REV 1110-1-1801)

GPO 1960 OF - 626-609

PROJECT
CUCHILLO NEGRO
CRK DAM

HOLE NO
CN-CH-26

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
PROJECT		SWD		Albuquerque Dist.		1 OF SHEETS	
1. PROJECT		Cuchillo Negro Crk Dam		10. SIZE AND TYPE OF BIT		HQ wireline	
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (TBM or MLL)			
3. DRILLING AGENCY		Mobile Dist.		12. MANUFACTURER'S DESIGNATION OF DRILL		FALLING 314	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-27		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
5. NAME OF DRILLER		C. Brown		14. TOTAL NUMBER CORE BOXES		3	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN		17.7		16. DATE HOLE		STARTED 12-7-88 COMPLETED 12-9-88	
8. DEPTH DRILLED INTO ROCK		32.7		17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE		50.4		18. TOTAL CORE RECOVERY FOR BORING		98	
				19. SIGNATURE OF INSPECTOR		James H. McCallum	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling rate, water loss, depth of weathering, etc., if significant)	
	2		Overburden, sand gravel, cobbles.			Rock bitted to TOR using Revert.	
	4						
	6						
	8						
	10						
	12						
	14					Set 4" casing to 17.7'	
	16						
	18		T.O.R. Limestone, mod hd to hd, sl wea to unwea, f. xln to micro xln w/calc xls med to			17.7 P-1 Ran: 3.7 RQD: 72% Rec: 3.5 Loss: 0.2 U.L.: 0.2 Time: N/R	
	20						

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PROJECT CUCHILLO NEGRO CRK DAM

HOLE NO. CN-CH-27

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CN-CH-27	
PROJECT CUCHILLO NEGRO CRK DAM			INSTALLATION ALBUQUERQUE DIST		SHEET 2 OF 3 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20		thick bdd, red. brn w/num nod and lenses of hd, f. xln, gray limestone.	95	wrap # 1	Drl Act: Smooth Hyd. press: 200psi DWR CD 21.4
	22		ptgs, ti, st, 18.7 @ 35° jt, op, prob. core loss.		Box 1 of 3	P-2 Ran: 10.0 Rec: 10.0 Loss: 0.0 U.L.: 0.0 Time: 57 min DWR: Yes Drl Act: Smooth Hyd. Press: 200psi RQD: 94 %
	24		H.B.			
	26		bdd ptg, ti, st, 200	100		
	28		jt, calc filled, sl wea, 65° jt, op, st, 5° bdd ptg, ti, st.			
	30		H.B. jt, calc filled, sl wea, 65° H.B.			
	32		Limestone, as above, med. bdd.		Box 2 of 3	C.D. 31.4 P-3 Ran: 10.2 Rec: 9.8 Loss: 0.4 U.L.: 0.4 Time: N/R Drl Act: Smooth DWR: Yes Hyd Pres: 200psi RQD: 85%
	34			96		
	36					
	38					
	40					
	42		H.B. Limestone, as above, thick bdd. H.B. jt, calc filled, ti, 65°	100	Box 3 of 3	C.D. 41.6 P-4 Ran: 8.8 Rec: 8.8 Loss: 0.0 U.L.: 0.0
	44					

ENG FORM 1836-A (R 1110-1-1801) GPO 1960 OF - 620 - 603

PROJECT CUCHILLO NEGRO CRK DAM
HOLE NO. CN-CH-27

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. CN-CH-27		
PROJECT		INSTALLATION		SHEET 3 OF 3 SHEETS		
CUCHILLO NEGRO CRK DAM ALBUQUERQUE DIST						
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	44					Time: N/R Dri Act: Smooth
	46		Limestone, med hd to hd, mostly unwea, f. to med. xln, thick bdd w/occ. shaly ptgs, gray.		WRP # 2	DWR: YES Hyd Press: 200 psi ROD: 87%
	48		bdd ptgs, LA (20%), ti, st.		Box 3 of 2	
	50					C.D. 50.4
			BOH			

ENG FORM
JUN 67

1836-A

(NR 1110 1-1801)

GPO 1960 OF - 628 - 803

PROJECT

CUCHILLO NEGRO
CRK DAM

HOLE NO

CN-CH-27

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		SWD		Alleg.		7 OF 42 SHEETS	
2. LOCATION (Coordinates or Station)		Cuchillo Negro		10. SIZE AND TYPE OF BIT		4.0 W.L.	
3. DRILLING AGENCY		MORRIS D&T		11. DATUM FOR ELEVATION SHOWN (TBM or MLL)		NEUD	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-28		12. MANUFACTURER'S DESIGNATION OF DRILL		EQUINOX 214	
5. NAME OF DRILLER		CARL MOON		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		14. TOTAL NUMBER CORE BOXES		8	
7. THICKNESS OF OVERBURDEN		2.5		15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK		73.5		16. DATE HOLE		17 Dec 87	
9. TOTAL DEPTH OF HOLE		76		17. ELEVATION TOP OF HOLE		5418	
				18. TOTAL CORE RECOVERY FOR BORING		3	
				19. SIGNATURE OF INSPECTOR			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
1417	1		Overburden, sand, gravel, cobbles, & boulders			Rock bit too for 7.3' w/ bentonite	
	2						
	3		T.O.R. Limestone, fd-u. fd, sh. med., gray				
	4						
	5						
	6						
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DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <i>CN-CH-28</i>	
PROJECT		INSTALLATION			SHEET <i>2</i> OF <i>2</i> SHEETS	
ELEVATION <i>a</i>	DEPTH <i>b</i>	LEGEND <i>c</i>	CLASSIFICATION OF MATERIALS (Description) <i>d</i>	% CORE RECOVERY <i>e</i>	BOX OR SAMPLE NO <i>f</i>	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) <i>g</i>
45.11	20		bed pty, op, wca.			
	21		bed pty, op, wca.			
	22					C.D. 22.1
	23		" " " "			P-2 Fam: 10.1 C.D.: 10.1 Loss: 0 C.D.: 0
	24					Time: 1050-1055 Cut log: smooth FAD: 100% dr. time p/420
	25		limestone, hd. u. hd., un- wca, pinkish gray			
	26					
	27					
	28				25.25	
	29		calcite filled frac		25.0	some amount of calcite in bot of sample
	30					
	31		clay, silty, sandy, orange			
	32		calcite filled frac, crystals 4.3 1/4"			D 22.2 P-3
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43		limestone, hd. u. hd., un- wca, gray			
	44					
	45					
	46					
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DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE		Hole No. <i>CH-CH-78</i>		
PROJECT		INSTALLATION		SHEET <i>3</i> OF <i>4</i> SHEETS		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc. if significant) g
1574	44					
	45					
	46		limestone, fine-grained, gray			
	47					
	48					
	49					
	50		* limestone, st. med. to hd- mod hd, gray			
	51					
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	200					

ENG FORM 1836-A

(BR 1110 1-1801)

GPO 1980 OF - 628-603

PROJECT

HOLE NO

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. <i>CN-CH-28</i>	
PROJECT		INSTALLATION			SHEET <i>4</i> OF <i>4</i> SHEETS	
ELEVATION <i>a</i>	DEPTH	LEGEND <i>c</i>	CLASSIFICATION OF MATERIALS (Description) <i>d</i>	% CORE RECOV <i>e</i>	BOX OR SAMPLE NO <i>f</i>	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) <i>g</i>
<i>1550</i>	<i>68</i>				<i>68.65</i>	
	<i>69</i>					
	<i>70</i>					
	<i>71</i>					
	<i>72</i>					<i>CD 71.9</i>
	<i>73</i>					<i>P-7</i>
	<i>74</i>		<i>Limestone, hd, gen approx, dark gray</i>			<i>Len: 4.1</i>
	<i>75</i>		<i>calc. te seams</i>			<i>Len: 2.4</i>
<i>1542</i>	<i>76</i>		<i>ICH</i>			<i>Loss: 0.4</i>
						<i>W: 0.4</i>
						<i>2.1 Act: Smooth</i>
						<i>SG: 100%</i>
						<i>CD 76.0</i>

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE #660.0		Hole No. CN-CH-24	
PROJECT Cochise No. 100			INSTALLATION		SHEET 2 OF 2 SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20		limestone, tan, v. hd, con. esp.			
	21		limestone, tan, m. hd, con.			CD 21.5
	22		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	23		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	24		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	25		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	26		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	27		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	28		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	29		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	30		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	31		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	32		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	33		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	34		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	35		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	36		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	37		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	38		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	39		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	40		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	41		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	42		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	43		limestone, tan, m. hd, con.			CD 21.5 21.5' total
	44		limestone, tan, m. hd, con.			CD 21.5 21.5' total

HOW NO

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No.	
PROJECT			INSTALLATION		SHEET OF SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
69						
70						
71						
72			weathered, soft, silty, red brown			
73				CL		11. 72.8
74			LIMESTONE - Hard, dense, bedding plane $\approx 25^\circ$, fossiliferous		Box 3	Delivered mostly on 30 Jan 89
75						ROD - 62.5
76			Limestone, argillaceous, weathered, bedding intact, dense, carbonate along bedding planes			Drilling somewhat slow
77			limestone, calcareous, upper and clayey		WEAP #2	
78						
79					WEAP #3	
80						
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DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. CA-CH-29	
PROJECT			INSTALLATION		SHEET OF SHEETS	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	92.0					ROD - 100%
	94		Limestone, hard, dense			END RUN 92.8'
			fractured, w. some weathering			Logging @ 20 AM
						Good hole
	96					ROD - 55%
	98		Limestone, hard, dense	75%		
			fractured, w. some weathering			
	100		Limestone, argillaceous			
			unweathered, no oil			
			traces of S ²⁺ , some			
			brecciated to drill			
	102					slight water
						in hole 10' down
	104					ROD - 100%
						Logging 100%
						ROD - 100%
	106					7' 1" lost record
						Core Rec. 100%
	108					ROD - 100%
						Logging 100%
	110					plus in core block, etc.
						Logging 100%
	112					Logging 100%
						Logging 100%
	114					ROD - 60%
						Logging 100%
	116					ROD - 100%
						Logging 100%
	118					ROD - 100%
						Logging 100%
	120					ROD - 100%
						Logging 100%
	122					ROD - 100%
						Logging 100%
	124					ROD - 100%
						Logging 100%
	126					ROD - 100%
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	128					ROD - 100%
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	130					ROD - 100%
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	132					ROD - 100%
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	134					ROD - 100%
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	136					ROD - 100%
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	138					ROD - 100%
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	140					ROD - 100%
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	142					ROD - 100%
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	144					ROD - 100%
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	146					ROD - 100%
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	150					ROD - 100%
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	316					ROD - 100%
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	318					ROD - 100%
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	320					ROD - 100%
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	322					ROD - 100%
						Logging 100%
	324					ROD - 100%
						Logging 100%
	326					ROD - 100%

DRILLING LOG (Cont Sheet)			ELEVATION TOP OF HOLE		Hole No. 7111-4-21	
PROJECT			INSTALLATION		SHEET OF SHEETS	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	142				7	END RUN 140.7 @ 11:11 A.M.
	144		Sand, clay, silt with sand shell			Due to sand coming bottom of hole & also sand hole was filled in.
	146		30- 143.7			3 FEB 81 END RUN 145.7 @ 9:47
	148					
	150					

DRILLING LOG		DIVISION	INSTALLATION		Hole No. <u> </u>
1. PROJECT <u>Puchillo Negro</u>		<u>Southern</u>	<u> </u>		SHEET <u>1</u> OF <u>3</u> SHEETS
2. LOCATION (Coordinate or Station) <u>Lower end of old railway channel</u>					
3. DRILLING AGENCY <u>Ukster Technologies</u>					
4. HOLE NO. (As shown on drawing title and file number) <u>CN-CH-34</u>					
5. NAME OF DRILLER <u>Ray Perren</u>					
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED <u> </u> DEG. FROM VERT.					
7. THICKNESS OF OVERBURDEN					
8. DEPTH DRILLED INTO ROCK					
9. TOTAL DEPTH OF HOLE					
		10. SIZE AND TYPE OF BIT <u>5" bit, 2" stem flight auger</u>			
		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
		12. MANUFACTURER'S DESIGNATION OF DRILL <u>CME-SS</u>			
		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
		14. TOTAL NUMBER CORE BOXES			
		15. ELEVATION GROUND WATER			
		16. DATE HOLE		STARTED <u>4/11/89</u> COMPLETED <u> </u>	
		17. ELEVATION TOP OF HOLE			
		18. TOTAL CORE RECOVERY FOR BORING <u> </u> %			
		19. SIGNATURE OF INSPECTOR <u> </u>			

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	1		SANDY GRAVEL (G), multicolored, 25-60-70% subrounded to sub angular gravel to 3 inches, mostly 2 inches, 30-40% subrounded fine to coarse sand, loose, cemented, calcareous (CC) lump scattered cobbles			1st light + bit 5.9' 3633 commence drilling very rough
	2		CLAYEY OR GRAVELLY SAND, primarily dark yellowish orange (Oxide), 60-70% sub angular gravel to 1 inch, 30-35% predominantly plastic clay, 10-20% fine to medium trace of coarse subangular sand, firm, non cemented, calcareous lump gravel hard and tubular			Drilling fast & smooth
	3					
	4		Same as above			Steel 5-4 SU 0.6 Depth 4.8
	5					
	6					
	7					Drilling fast & smooth
	8		CLAYEY SAND w/ GRAVEL, primarily dark yellowish brown (oxide), 50-60% fine to medium sand, 20-30% low plastic (lean) clay, 20% subangular gravel to 1 inch, firm, non cemented, calcareous (CC)			Steel 10.4 SU 0.6 Depth 9.8
	9					

DRILLING LOG		DIVISION Southwest	INSTALLATION Albuquerque District	HOLE NO. <u>CN-CH-54</u> SHEET <u>2</u> OF <u>3</u> SHEETS
1. PROJECT <u>Cochillo Negro</u>			10. SIZE AND TYPE OF BIT <u>9" double stem / NY diamond</u>	
2. LOCATION (Coordinates or Station) <u>Lower end of Cochillo Spillway</u>			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY <u>Western Technologies</u>			12. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>	
4. HOLE NO. (As shown on drawing title and file number)			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>
5. NAME OF DRILLER <u>Ray Ferguson</u>			14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN <u>18'</u>			16. DATE HOLE	STARTED <u>11 Apr 1969</u> COMPLETED
8. DEPTH DRILLED INTO ROCK			17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE			18. TOTAL CORE RECOVERY FOR BORING <u>1</u>	
			19. SIGNATURE OF INSPECTOR <u>[Signature]</u>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Same as above, except slightly cemented			
	11		- dry			
	12		12' to 13'			
	13		drilled through weathered limestone boulder			Drilling v. rough Steel 15' 4" SU 1' 9" Depth 13' 6"
	14					
	15		SILTY GRAVEL, primarily dark yellowish orange (10YR 4/6), damp, 80-90% angular to sub- angular limestone gravel and finch, 10-50% silt, trace of sand, firm, calcareous, slightly cemented (FC)			Drilling slow and a little rough
	16					
	17					Steel 20' 8" SU 2' 3" Depth 18' 1"
	18		Top of Rock 18' another boulder			02/19 switch to NY diamond bit - 11/15/69 0.65' long w/ spacer, 14 steel w/ bit in 7.3' 1115 Start NY coring
	19					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT Cochillo Negro

HOLE NO. CN-CH-54

DRILLING LOG		DIVISION	INSTALLATION	SHEET	
1. PROJECT <i>Cuchilla</i>		<i>SWD</i>	<i>Alb. Dist.</i>	OF 3 SHEETS	
2. LOCATION (Coordinates or Station)		10. SIZE AND TYPE OF BIT <i>NY core barrel</i>			
3. DRILLING AGENCY <i>Alb. Dist.</i>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-34</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>CME 75</i>			
5. NAME OF DRILLER <i>Western Technology</i>		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES			
7. THICKNESS OF OVERBURDEN <i>24.1'</i>		15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK <i>5.4'</i>		16. DATE HOLE			
9. TOTAL DEPTH OF HOLE <i>29.5'</i>		17. ELEVATION TOP OF HOLE			
		18. TOTAL CORE RECOVERY FOR BORING			
		19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOV- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
	21					<i>Drilled 19.1'-23.1' w/ NY core barrel, did not recover any core finished at 1520</i>
	22					
	23					
	24		<i>Top of Rock 24.1'</i>			
	25		<i>Limestone, gray hd</i>			
	26		<i>Chalk? white - lt tan</i>	<i>25%</i>		
	27					
	28					
	29		<i>1.5' gray hd.</i>			
			<i>refused 19' 29.5'</i>			<i>refusal caused by core barrel rubbing on inside of 15 Auger CN-CH-35 will be drilled w/out Auger</i>

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT

HOLE NO
CN-CH-34

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		S.W.D.		Alb. Dist.		1 OF 1 SHEETS	
2. LOCATION (Coordinates or Station)		Cuchillo Spillway		10. SIZE AND TYPE OF BIT		7" Auger + NX core barrel	
3. DRILLING AGENCY		Alb. Dist.		11. DAYTON FOR ELEVATION SHOWN (FSM or MSL)			
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-35		12. MANUFACTURER'S DESIGNATION OF DRILL		CME-75	
5. NAME OF DRILLER		Western Tech.		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		1	
7. THICKNESS OF OVERBURDEN		26.1'		15. ELEVATION GROUND WATER		not encountered	
8. DEPTH DRILLED INTO ROCK		5.9'		16. DATE HOLE		STARTED 11 Apr 89 COMPLETED 14 Apr 89	
9. TOTAL DEPTH OF HOLE		32'		17. ELEVATION TOP OF HOLE			
				18. TOTAL CORE RECOVERY FOR BORING		3	
				19. SIGNATURE OF INSPECTOR		Stephen D. Morley	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	2		Gravel, sandy, silty, brn.			11 Apr 89 1550-1750 Drilling w/ NX core barrel and air	
	4					12 Apr 89 no drilling from 0700-1000 driller was ordering new NX core bits and helper was welling an auger from 0800-0910.	
	6		color changed to black-gray			Started drilling operations at 1000, at 1050 began using auger after removing NX core barrel.	
	8						
	10		pinkish-lt brn, little clay				
	12						
	14						
	16						
	18						
	20						
	22		Layers of sandy clay, L.S., & gravel			hit hard object @ 22' began using NX barrel w/ air. Down from 1500-1500.	
	24		Three colors of L.S., dk yellow, gray, & dk. brn. red	90%	1	1500-1600 Drilling w/ water @ 22', stopped at 27', couldn't remove core barrel	
	26		Sandy clay, red & tan 26.1'	25.75'			
	28		L.S. Gray, mod. hd.				
	30		shaly, argillaceous L.S., seams, red. brn.	100%	2	No drilling on 13 Apr 14 Apr 89 0855-0955	
	32		BoH				
	34						

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
		<i>S.W.D.</i>	<i>Alb. Dist.</i>	OF 1 SHEETS		
1. PROJECT <i>Cuchilla Spillway</i>			10. SIZE AND TYPE OF BIT <i>3" Auger & NX core barrel</i>			
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>Alb. Dist.</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>CME-75</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-36</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED <i>0</i> UNDISTURBED <i>0</i>			
5. NAME OF DRILLER <i>Western Tech.</i>			14. TOTAL NUMBER CORE BOXES <i>1</i>			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER <i>not encountered</i>			
7. THICKNESS OF OVERBURDEN <i>20.5'</i>			16. DATE HOLE STARTED <i>14 April 89</i> COMPLETED <i>same</i>			
8. DEPTH DRILLED INTO ROCK <i>7.5'</i>			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE <i>28'</i>			18. TOTAL CORE RECOVERY FOR BORING <i>1</i>			
			19. SIGNATURE OF INSPECTOR <i>Stephen D. Morley</i>			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	2		Gravel, sandy, silty, max. 5" brn			1100-1230 +
	4		Gravel, sandy, clayey, max. 1"			1430-1530
	6					cobble @ 6'
	8					
	10					
	12					
	14					
	16					
	18					
	20		To R 20.5'			hard object @ 21'
	22		L.S. gray, hd. w/ small clay seams 21.75'	100%	1	will start coring
	24		wide gravel to 1/2" L.S. argillaceous, lt gray, soft to med. hd.	92%	2	
	26					
	28		Chert, black L.S. argillaceous, gray & tan B o H			26.75'
	30					

DRILLING LOG		DIVISION	INSTALLATION		Hole No. <i>CN-CH-37</i>	SHEET 1 OF 2 SHEETS
1. PROJECT <i>Cochillo Spillway</i>			10. SIZE AND TYPE OF BIT <i>8" Auger & NX core barrel</i>			
2. LOCATION (Coordinates or Station)			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <i>Alb. Dist.</i>			12. MANUFACTURER'S DESIGNATION OF DRILL <i>CME-15</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-37</i>			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN			DISTURBED <input type="checkbox"/> UNDISTURBED <input type="checkbox"/>
5. NAME OF DRILLER <i>Western Tech.</i>			14. TOTAL NUMBER CORE BOXES <i>1</i>			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN <i>37.8'</i>			16. DATE HOLE			STARTED <i>14 Apr '87</i> COMPLETED <i>15 Apr '87</i>
8. DEPTH DRILLED INTO ROCK <i>10.2'</i>			17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE <i>48'</i>			18. TOTAL CORE RECOVERY FOR BORING <i>2</i>			
			19. SIGNATURE OF INSPECTOR <i>Stephen O. Marty</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	2		Gravel, sandy, silty, max 3", lt. brn			14 Apr '87 1635-1805 15 Apr '87 0715-0845
	4					
	6		Same as above but max 4"			
	8		Gravel, clayey, sandy, lt brn, max 1/2"			
	10					
	12					
	14					
	16					
	18		Clay, gravelly, sandy, brn, max 3/8"			
	20					
	22					
	24		Same as above but lt brn			
	26					
	28					
	30					Seams of lt. tan silt @ 30'
	32					
	34					Hard surface @ 33'
	36					
	38		Top of Rock 37.8' LS, pink			15 Apr start @ 38'
	40		Void			

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PROJECT *Cochillo Spill.* HOLE NO. *CN-CH-37*

DRILLING LOG		DIVISION	INSTALLATION	FIG 10 110.	SHEET OF 2 SHEETS	
1. PROJECT <i>Cuchillo Spillway</i>		<i>S.W.D.</i>	<i>Alb. Dist.</i>	10. SIZE AND TYPE OF BIT <i>8" Auger + NX core barrel</i>		
2. LOCATION (Coordinate or Station)				11. DATUM FOR ELEVATION SHOWN (FSM or MSL)		
3. DRILLING AGENCY <i>Alb. Dist.</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>CME-75</i>		
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-37</i>				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED <input type="checkbox"/> UNDISTURBED <input type="checkbox"/>		
5. NAME OF DRILLER <i>Western Tech.</i>				14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN <i>37.8'</i>				16. DATE HOLE STARTED <i>14 Apr 89</i> COMPLETED <i>15 Apr 89</i>		
8. DEPTH DRILLED INTO ROCK <i>10.2'</i>				17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE <i>48'</i>				18. TOTAL CORE RECOVERY FOR BORING %		
				19. SIGNATURE OF INSPECTOR <i>Stephen D. Marty</i>		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	40		Void (cont.)			
	42		LS, gray, hard			LS, red sand
	44		LS, Pink			
	46		LS, Shale, Clayey LS, Fractured, soft to med. hd.	768		Calcite sand
	48		BCH			
	50					

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PROJECT *Cuchillo Spill.* HOLE NO. *CN-CH-37*

DRILLING LOG		DIVISION <i>S.W.D.</i>		INSTALLATION <i>Alb. Dist.</i>		SHEET 1 OF 3 SHEETS	
1. PROJECT <i>Cuchilla Spillway</i>				10. SIZE AND TYPE OF BIT <i>8" Auger + NX core barrel</i>			
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (FSM or MSL)			
3. DRILLING AGENCY <i>Alb. Dist.</i>				12. MANUFACTURER'S DESIGNATION OF DRILL <i>CME - 75</i>			
4. HOLE NO. (As shown on drawing title and file number) <i>CN-CH-38</i>				13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN		DISTURBED <input type="checkbox"/> UNDISTURBED <input type="checkbox"/>	
5. NAME OF DRILLER <i>Western Tech.</i>				14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER			
7. THICKNESS OF OVERBURDEN <i>52'</i>				16. DATE HOLE STARTED <i>18 Apr 89</i> COMPLETED <i>19 Apr 89</i>		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK <i>11.1'</i>				18. TOTAL CORE RECOVERY FOR BORING %			
9. TOTAL DEPTH OF HOLE <i>73.1'</i>				19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	2		Gravel, sandy, silty, lt. brn max 4"			8760 - 1460	
	4		Gravel, sandy, silty, lt. brn max 3 1/2"				
	6						
	8		Clay, sandy, lt. brn, trace fine gravel (less than 5%)				
	10						
	12						
	14		Sand, silty, lt. brn, little fine gravel (C 108)				
	16						
	18						
	20						
	22		Clay, sandy, gravelly, brn, max 1 1/2"				
	24						
	26		Same as Above but mostly dk. brn				
	28						
	30						
	32						
	34						
	36						
	38						
	40						

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PROJECT *Cuchilla Spill.* HOLE NO. *CN-CH-38*

DRILLING LOG		DIVISION	INSTALLATION	SHEET 2 OF 3 SHEETS		
1. PROJECT		S.W.D.	Alb. Dist.	10. SIZE AND TYPE OF BIT 8" Auger + NX core barrel		
2. LOCATION (Coordinates or Station)				11. DATUM FOR ELEVATION SHOWN (BM or MSL)		
3. DRILLING AGENCY				12. MANUFACTURER'S DESIGNATION OF DRILL		
4. HOLE NO. (As shown on drawing title and file number)		Alb. Dist.	CN-CH-38	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
5. NAME OF DRILLER		Western Tech.		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE				15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN		82'		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK		11.1'		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE		93.1'		18. TOTAL CORE RECOVERY FOR BORING		
				19. SIGNATURE OF INSPECTOR		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
40			Clay (cont.)			
42						
44						
46						
48						
50			Clay, lt. brn, hi. plast		#1	
52						
54						
56						
58			Clay, lt. brn, l. ttle sandy, trace gravel, "max 1/2"			
60						
62						
64						
66					#2	66'
68						68'
70						Wtr @ 71'
72			Clay, red-brn, hi plast, wet		#3	72'
74						74'
76						
78						Hard object @ 77.5'
80			Top of Rock @ 82'			Begin Coring @ 81.5

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PROJECT Guachilla Spill. HOLE NO. CN-CH-38

DRILLING LOG		DIVISION S.W.D.	INSTALLATION Alb. Dist.	SHEET 3 OF 3 SHEETS
1. PROJECT Cuchilla Spillway		10. SIZE AND TYPE OF BIT 3" Auger & NX core barrel		
2. LOCATION (Coordinate or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)		
3. DRILLING AGENCY Alb. Dist.		12. MANUFACTURER'S DESIGNATION OF DRILL CME-75		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-38		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED
5. NAME OF DRILLER Western Tech.		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN 82'		16. DATE HOLE STARTED 18 Apr 89 COMPLETED 19 Apr 89		
8. DEPTH DRILLED INTO ROCK 11.1		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE 93.1		18. TOTAL CORE RECOVERY FOR BORING %		
		19. SIGNATURE OF INSPECTOR Stephen D. Martz		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
80						
82			Top of Rock			
	82.4'		LS, gray w/red inclusions, clay seams, fractured, weathered		#1	
84			Void			
86				08	#2	
88						87.4'
90			LS, yellow-red, fracturing, argillaceous LS, grayish-brown & black w/calcite seams, quartz crystals LS and Clay		#3	90.4'
92			No Core Recovery	02	#4	
94						refusal due to shearing of threads on core barrel 19 Apr 89 0700-1100 H.D. Hing @ 93'

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT		Southwest	Albuquerque District	1 OF 5 SHEETS		
2. LOCATION (Coordinates or Station)		Cuchillo Negro Dam Site	10. SIZE AND TYPE OF BIT			
3. DRILLING AGENCY		National Millway/Borow Area	11. DATUM FOR ELEVATION SHOWN (FSM or MSL)			
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-39	12. MANUFACTURER'S DESIGNATION OF DRILL			
5. NAME OF DRILLER		Ray Reigerson	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN			
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.	14. TOTAL NUMBER CORE BOXES			
7. THICKNESS OF OVERBURDEN		33 [±] feet	15. ELEVATION GROUND WATER			
8. DEPTH DRILLED INTO ROCK		93 feet	16. DATE HOLE			
9. TOTAL DEPTH OF HOLE		473 feet	17. ELEVATION TOP OF HOLE			
			18. TOTAL CORE RECOVERY FOR BORING			
			19. SIGNATURE OF INSPECTOR			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	1		WELL GRADED GRAVEL WITH SAND (GW), multicolored, dry, composed of 65-75% subrounded to rounded gravel to 3 inches, 25-35% subrounded to subangular fine to coarse, mostly fine to medium sand, loose, calcareous (strong reaction with HCl), largest gravel is hard volcanics & limestone, trace of fines, scattered cobbles & boulders (etc)			1500 Start Drilling
	2		2-10% low plastic fines-silt			Drilling smooth and fast
	3					
	4		POORLY GRADED GRAVEL WITH SAND (GP) same as above, except most gravel is less than 1 inch, trace of silt, and color is primarily grayish orange pink (5YR 4/2), wet color is moderate brown (5YR 4/4)			String 5 ⁰ SU 1 ⁰ Depth 49
	5					
	6					Drilling smooth and fast
	7		5-10% medium plastic fines			
	8					
	9					String lot SU 1 ⁰ Depth 91

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PROJECT Cuchillo Negro

HOLE NO. CN-CH-39

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 5 SHEETS	
1. PROJECT		Southwest		Albuquerque District			
2. LOCATION (Coordinates of Station)		Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT 6" hollow stem auger			
3. DRILLING AGENCY		Optional Spillway/Borrow Area		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)			
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-39		12. MANUFACTURER'S DESIGNATION OF DRILL		CME-75	
5. NAME OF DRILLER		Ray Pergeesen		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		2	
7. THICKNESS OF OVERBURDEN		33' ft		15. ELEVATION GROUND WATER		not encountered	
8. DEPTH DRILLED INTO ROCK		9' ft		16. DATE MOLE		STARTED 19 April 1989 COMPLETED 19 April 1989	
9. TOTAL DEPTH OF HOLE		42' ft		17. ELEVATION TOP OF HOLE		~ 4710 ft	
				18. TOTAL CORE RECOVERY FOR BORING		%	
				19. SIGNATURE OF INSPECTOR		Christopher B. D. [Signature]	
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV. e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
			Same as above				
	11						
	12					Drilling smooth and fast	
	13		most gravel less than 1 1/2 inch with scattered larger gravel and cobbles				
	14					String 15 1/2 Su 1 0 Depth 14 1/2	
	15						
	16		most gravel less than 3/4"			Drilling fast and smooth	
	17						
	18		POORLY GRADED GRAVEL - WITH CLAY & SAND (GP-GC); dry; grayish orange pink (5A2 7/2) wet is moderate brown (5YR 4/6); 60-70% subangular to sub- rounded gravel to 1 1/2 inch. Most less than 1 inch, 15-25% subangular to subrounded fine to coarse sand, 5-15% medium plastic fines; loose to firm, uncemented to slightly cemented; cataclastic sand & fines; gravel mostly hard volcanics (FC)			String 20 1/2 Su 1 0 Depth 19 1/2	
	19						

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MAR 71 (TRANSLUCENT)

PROJECT Cuchillo Negro HOLE NO. CN-CH-39

DRILLING LOG		DIVISION		INSTALLATION		SHEET 3 OF 5 SHEETS	
1. PROJECT		South west		Albuquerque District			
2. LOCATION (Coordinates or Station)		Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT		8" high speed flight auger	
3. DRILLING AGENCY		Western Technologies		11. DATUM FOR ELEVATION SHOWN		1989 = 1985	
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-39		12. MANUFACTURER'S DESIGNATION OF DRILL		CME - 75	
5. NAME OF DRILLER		Ray Ferguson		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		2	
7. THICKNESS OF OVERBURDEN		33 1/2 ft		15. ELEVATION GROUND WATER		not encountered	
8. DEPTH DRILLED INTO ROCK		9 1/2 ft		16. DATE HOLE		STARTED 19 Apr 1989 COMPLETED 19 April 1989	
9. TOTAL DEPTH OF HOLE		42 3/4 ft		17. ELEVATION TOP OF HOLE		~ 4710 ft	
				18. TOTAL CORE RECOVERY FOR BORING		%	
				19. SIGNATURE OF INSPECTOR		C. J. [Signature]	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			Same as above				
	21		most grave less than 3/4"			Drilling fast and smooth	
	22		POORLY SORTED GRAVEL (GP), dry, light brown (5YR 6/4), moderate brown (5YR 2.4) when wet, about 90% subangular to subrounded, hard, gravel to 1 inch, most less than 3/4 inch, 5% can of fine to coarse sand and highly plastic fat clay, loose, noncemented, highly calcareous (FC)			String 25 1/2	
	23		SANDY FAT CLAY WITH GRAVEL (CH), dry, light brown (5YR 6/4), about 40% highly plastic fat clay, 30% subrounded, hard gravel to 1/2", 30% subrounded, fine to coarse sand, stiff, noncemented, highly calcareous (FC)			SU 12	
	24		SANDY FAT CLAY WITH GRAVEL (CH) as above, except 65-75% highly plastic clay, 35-35% subrounded to subangular, fine to coarse, mostly coarse sand (FC)			Depth 24 1/2	
	25		SANDY FAT CLAY WITH GRAVEL (CH) as above, except 65-75% highly plastic clay, 35-35% subrounded to subangular, fine to coarse, mostly coarse sand (FC)			Drilling fast and smooth	
	26		SANDY FAT CLAY WITH GRAVEL (CH) as above, except 65-75% highly plastic clay, 35-35% subrounded to subangular, fine to coarse, mostly coarse sand (FC)				
	27		SANDY FAT CLAY WITH GRAVEL (CH) as above, except 65-75% highly plastic clay, 35-35% subrounded to subangular, fine to coarse, mostly coarse sand (FC)				
	28		CLAYEY GRAVEL WITH SAND (GC), dry, pale yellowish brown (10YR 6/4), about 60% hard, subangular to subrounded, calcic coated gravel to 3/4 inch, most less than 1/2 inch, 20% high plastic fines, 20% fine to coarse subangular to angular sand, firm to v firm			String 30 1/4	
	29		CLAYEY GRAVEL WITH SAND (GC), dry, pale yellowish brown (10YR 6/4), about 60% hard, subangular to subrounded, calcic coated gravel to 3/4 inch, most less than 1/2 inch, 20% high plastic fines, 20% fine to coarse subangular to angular sand, firm to v firm			SU 12	
						Depth 29 1/2	

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PROJECT Cuchillo Negro HOLE NO. CN-CH-39

DRILLING LOG		DIVISION	INSTALLATION		SHEET 4 OF 5 SHEETS	
1. PROJECT Cuchillo Negro Dam site		Southwest	Albuquerque District			
2. LOCATION (Coordinates or Station) Optional Spillway / Borrow Area			10. SIZE AND TYPE OF BIT 8" HS flint over / NY wire line			
3. DRILLING AGENCY Western Technologies			11. DATUM FOR ELEVATION SHOWN (TBM or BSL)			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-39			12. MANUFACTURER'S DESIGNATION OF DRILL CME-75			
5. NAME OF DRILLER Ray Ferguson			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED 0	UNDISTURBED 0
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			14. TOTAL NUMBER CORE BOXES 2			
7. THICKNESS OF OVERBURDEN 33 1/2 ft			15. ELEVATION GROUND WATER not encountered			
8. DEPTH DRILLED INTO ROCK 9 1/2 ft			16. DATE HOLE 19 April 1989		STARTED 19 April 1989	
9. TOTAL DEPTH OF HOLE 42 1/2 ft			17. ELEVATION TOP OF HOLE ~ 4710.4		COMPLETED	
			18. TOTAL CORE RECOVERY FOR BORING 96.3%			
			19. SIGNATURE OF INSPECTOR [Signature]			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Scattered thin layers with gravel to 1 inch			Drilling slow and rough
	31		damp			
	32		SANDY FAT CLAY WITH GRAVEL (CH), same as at 23 1/2 except, damp, and slightly cemented (FC)			35 1/2 9 1/2
	33		CLAYEY GRAVEL WITH SAND (CH), same as at 31 1/2 (FC) 75% gravel to 1 1/2", 15% high plastic clay, 10% fine to coarse sand, no caliche			Drilling very slow String 35 1/2 SU 1 1/2 Depth 33 1/2
	34		LIMESTONE, mottled pale red (10R 6/2) and brownish gray (5Y 4/1), v. fine grained micrite; mod. soft to mod. hard; unweathered, mod. closely jointed, fractures tight, rough, coated with calcite and v. minor FeO and MnO, scattered v. thin, randomly oriented calcite veins throughout (FC) medium to thick bedded	Run #1 33 1/2 to 37 1/2 Core Recovery 4 1/2 95 1/2%	Box #1 33 1/2 to 41 1/2	1620 started coring run #1
	35					Drilling fast and smooth
	36					90% water return
	37		Scattered thin sandy beds to 1 inch thick at 70° from the core axis	LP-258 4 1/2 95 3/4%		1635 finished drilling run #1 String 42 3/4 SU 4 1/2 Depth 37 1/2
	38			Run #2 37 1/2 to 42 1/2 Core Recovery 4 1/2 97 3/4%		1700 start drilling run #2
	39		302 ft argillaceous zone w/ l.s. gang banding. ① open, 1/2 inch wide, filled with FeO stained clay and calcite, slightly rough very thin bedded with minor sandy limestone			

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
1. PROJECT		Southwest		Albuquerque District		SHEET 5 OF 5 SHEETS	
2. LOCATION (Coordinates or Station)		Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT		NX wireline core	
3. DRILLING AGENCY		Optional Spillway/Borrow Area		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
4. HOLE NO. (As shown on drawing title and file number)		Western Technologies		12. MANUFACTURER'S DESIGNATION OF DRILL		CME 75	
5. NAME OF DRILLER		CN-CH-39		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE		VERTICAL <input checked="" type="checkbox"/> INCLINED <input type="checkbox"/> DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		2	
7. THICKNESS OF OVERBURDEN		33 1/2 ft		15. ELEVATION GROUND WATER		not encountered	
8. DEPTH DRILLED INTO ROCK		92 ft		16. DATE HOLE		STARTED 15 Apr. 1989 COMPLETED 19 April 1989	
9. TOTAL DEPTH OF HOLE		42 7/8 ft		17. ELEVATION TOP OF HOLE			
				18. TOTAL CORE RECOVERY FOR BORING		96 %	
				19. SIGNATURE OF INSPECTOR		Christopher B. Quinn	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			BS above	1 in # 2 cont'd			
	41			RDD 4'25" / 50	Box #2 41'5" to 42'	Drilling fast and smooth	
	42			97%		String 47 3/4 SJ 4 1/2 Depth 42 7/8	
	43		B.O.H. 42 7/8	LP-155			
IP MADERA FORMATION							

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PROJECT Cuchillo Negro HOLE NO. CN-CH-39

DRILLING LOG			DIVISION		INSTALLATION		Hole No. <u>CN-CH-40</u>	
PROJECT			Southwest		Albuquerque District		SHEET 1 OF 9 SHEETS	
1. PROJECT			Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT		8" hollow stem flight auger	
2. LOCATION (Coordinates or Station)			National Spillway/Borrow Area		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)			
3. DRILLING AGENCY			Western Technologies		12. MANUFACTURER'S DESIGNATION OF DRILL		CME 75	
4. HOLE NO. (As shown on drawing title and 11" number)			CN-CH-40		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
5. NAME OF DRILLER			Ray Perlesen		14. TOTAL NUMBER CORE BOXES		2	
6. DIRECTION OF HOLE			<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		not encountered	
7. THICKNESS OF OVERBURDEN			63.45 ft		16. DATE HOLE		STARTED 20 April 1989 COMPLETED 20 April 1989	
8. DEPTH DRILLED INTO ROCK			22.25 ft		17. ELEVATION TOP OF HOLE		≈ 4725'	
9. TOTAL DEPTH OF HOLE			85.7 ft		18. TOTAL CORE RECOVERY FOR BORING		62%	
					19. SIGNATURE OF INSPECTOR		[Signature]	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)		
	1		WELL GRADED GRAVEL WITH SAND (GW); dry, grayish orange pink (5YR 7/2), about 65-75% subangular to subrounded hard gravel to 3 inches, most less than 2 inches; 25-35% fine to coarse, subrounded sand, trace of clay; loose, non cemented, calcareous (strong reaction with HCl) (FC)			4802 Start Drilling Drilling w/o helper		
	2		POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC); dry, grayish orange pink (5YR 7/2), moderate brown (5YR 4/4) when wet; about 60% subangular to subrounded, hard, calcareous coarse gravel to 2 inches, 30% subrounded fine to coarse, mostly fine to medium sand, 10% highly plastic fat clay; loose, non cemented, calcareous - strong reaction to HCl			Drilling smooth and fast		
	3							
	4					String set Su CB Depth 4'		
	5		Scattered larger gravel and cobbles			Drilling a little rough		
	6							
	7					Drilling smooth and fast		
	8					Drilling w/o helper		
	9		CLAYEY SAND WITH GRAVEL (SC); dry, light brown (5YR 6/4); moderate brown (5YR 4/4) when wet, about 40% subrounded to subangular, fine to coarse sand, 3-5% highly plastic fat clay, 20% subrounded to subangular, hard, calcareous gravel to 1 inch, loose, non cemented, calcareous - strong reaction to HCl (FC)			String 1.24 Su CB Depth 9'		

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PROJECT Cuchillo Negro HOLE NO. CN-CH-40

DRILLING LOG		DIVISION Southwest		INSTALLATION Albuquerque District		SHEET 2 OF 9 SHEETS	
1. PROJECT Cuchillo Negro Dam site				10. SIZE AND TYPE OF BIT 8" hollow stem flight auger			
2. LOCATION (Coordinates or Station) Optional Spillway Borrow Area				11. DATUM FOR ELEVATION SHOWN (FSM = MSL)			
3. DRILLING AGENCY Western Technologies				12. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-40				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
5. NAME OF DRILLER Ray Perlesen				14. TOTAL NUMBER CORE BOXES 2			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER not encountered			
7. THICKNESS OF OVERBURDEN 63.45 ft				16. DATE HOLE		STARTED 20 April 89 COMPLETED 20 April 1989	
8. DEPTH DRILLED INTO ROCK 22.25 ft				17. ELEVATION TOP OF HOLE 4725'			
9. TOTAL DEPTH OF HOLE 85.7 ft				18. TOTAL CORE RECOVERY FOR BORING 62.3%			
19. SIGNATURE OF INSPECTOR <i>M. Testa</i>							
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
a	b	c	d	e	f	g	
			as above				
	11						
	12		POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GI) as at 12 feet except gravel is to 1 inch			Drilling smooth and fast Drilling w/o helper	
	13						
	14					String 15'	
	15					SU 08	
	16					Depth 14'	
	17						
	18		WELL GRADED GRAVEL WITH SILT (GW-GM); dry; about 80% subangular to subrounded, hard gravel to 1 inch; 15% silt, trace of clay and fine to coarse sand, light brown (STR 4/4), mod. brown (STR 4/4) when wet; loose to firm, unconsolidated, calcareous - strong reaction to HCl			Drilling smooth and fast Drilling w/o helper	
	19					String 20'	
						SU 08	
						Depth 19'	

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PROJECT Cuchillo Negro

HOLE NO. CN-CH 40

DRILLING LOG		DIVISION	INSTALLATION		Hole No. CN-CH-40
1. PROJECT Cuchillo Negro Dam site		Southwest	Albuquerque District		SHEET 3 OF 9 SHEETS
2. LOCATION (Coordinates or Station) Optional Spillway / Borrow Area		10. SIZE AND TYPE OF BIT 8" Hollow stem light auger			
3. DRILLING AGENCY Western Technologies		11. DAYUM FOR ELEVATION SHOWN (TBM = MSL)			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-40		12. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
5. NAME OF DRILLER Ray Pergesen		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN <input checked="" type="checkbox"/> DISTURBED <input checked="" type="checkbox"/> UNDISTURBED			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES 2			
7. THICKNESS OF OVERBURDEN 63 1/2 ft		15. ELEVATION GROUND WATER not encountered			
8. DEPTH DRILLED INTO ROCK 27 23 ft		16. DATE HOLE 20 April 89 STARTED 20 April 89 COMPLETED			
9. TOTAL DEPTH OF HOLE 95 2 ft		17. ELEVATION TOP OF HOLE ~ 4725'			
		18. TOTAL CORE RECOVERY FOR BORING 62 3/4			
		19. SIGNATURE OF INSPECTOR <i>Christopher B. [Signature]</i>			

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
a	b	c	d	e	f	g
			as above			
21			POORLY GRADED GRAVEL WITH SAND (G.C.); dig. color as above. Gravel as above, 15% subangular to subangular, fine to medium sand; loose to firm, noncemented, calcareous - strong reaction to HCL, about 30% of gravel coated with caliche, most gravel is hard ishesus with minor limestone			Drilling smooth and easy Drilling w/o helper
22						
23						
24			alternating layers 6 inches to 1.5 feet of gravel to 1 1/2" and gravel to 3/4". Otherwise, as above			String 25 1/2 - 5L - 08 Depth 24 1/2
25						
26						
27			as above			Drilling smooth and easy Drilling w/o helper
28						
29						String 30 1/2 - 5L - 08 Depth 29 1/2

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PROJECT **Cuchillo Negro** HOLE NO. **CN-CH-40**

DRILLING LOG			DIVISION Southwest	INSTALLATION Albuquerque District	SHEET 4 OF 9 SHEETS	
1. PROJECT Cuchillo Negro			10. SIZE AND TYPE OF BIT 8" Hollow stem flight auger			
2. LOCATION (Coordinates or Station) Optional Spillway/Borrow Area			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY Western Technologies			12. MANUFACTURER'S DESIGNATION OF DRILL CME 75			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-40			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>	
5. NAME OF DRILLER Ray Pergeson			14. TOTAL NUMBER CORE BOXES 2		15. ELEVATION GROUND WATER not encountered	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> CLINED _____ DEG. FROM VERT.			16. DATE HOLE STARTED 20 April 1989 COMPLETED 20 April 1989		17. ELEVATION TOP OF HOLE 4725'	
7. THICKNESS OF OVERBURDEN 63.45 ft			18. TOTAL CORE RECOVERY FOR BORING 62%			
8. DEPTH DRILLED INTO ROCK 22.25 ft			19. SIGNATURE OF INSPECTOR Christopher B. Quitt			
9. TOTAL DEPTH OF HOLE 85.7 ft						

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			as above			
	31					
	32					Drilling smooth and fast
	33					Drilling w/o helper
	34		SILTY GRAVEL (GM); dry; light brown (S 7.5 Y 4.5), mod. brown (S 7.5 R 4.5) when wet; about 80% subangular to subrounded gravel to 1/2 inch, 15% non- plastic fine silt, trace of clay and sand; firm, non- cemented, calcareous, - strong reaction with HCl (FC)			String 35 4 Silt 0.8 Depth 34.5
	35		as above except alterna- ting layers where gravel varies in size to 3/4", 1", and 1 1/2 inch; otherwise, no change			
	36					Drilling smooth, but slower
	37		CLAYEY SAND (SC); dry; color as above; about 60% subangular to subrounded coarse sand & 20% fine to med. sand for 80% sand total, 15% clay, plastic fat clay, trace of subangular to subrounded gravel to 1/4 inch, loose, noncemented, calcareous, strong reaction w/ HCL (FC)			Drilling w/o helper
	38					Drilling smooth and fast
	39		SILTY GRAVEL (GM); ss at 35.5' (FC)			String 40 4 Silt 0.8 Depth 39.4

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PROJECT Cuchillo Negro HOLE NO. CN-CH-40

Hole No. CN-CH-40

DRILLING LOG		DIVISION Southwest	INSTALLATION Albuquerque District	SHEET 5 OF 9 SHEETS
1. PROJECT <u>Cuchillo Negro</u>			10. SIZE AND TYPE OF BIT <u>8" hollow stem flight auger</u>	
2. LOCATION (Coordinates or Station) <u>National Spillway/Borrow Area</u>			11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY <u>Western Technologies</u>			12. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>	
4. HOLE NO. (As shown on drawing title and file number) <u>CN-CH-40</u>			13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN <u>0</u> <u>0</u> <u>0</u>	
5. NAME OF DRILLER <u>Ray Peterson</u>			14. TOTAL NUMBER CORE BOXES <u>2</u>	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER <u>not encountered</u>	
7. THICKNESS OF OVERBURDEN <u>63.45 ft.</u>			16. DATE HOLE <u>STARTED 20 April 1969</u> <u>COMPLETED 20 April 1969</u>	
8. DEPTH DRILLED INTO ROCK <u>22.25 ft</u>			17. ELEVATION TOP OF HOLE <u>4725'</u>	
9. TOTAL DEPTH OF HOLE <u>85.7 ft</u>			18. TOTAL CORE RECOVERY FOR BORING <u>62.3%</u>	
			19. SIGNATURE OF INSPECTOR <u>Christopher B. O'Neil</u>	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			cobble			Drilling very rough
			SILTY GRAVEL (GM), 25 above			Drilling smooth and easy
	41					Drilling w/o helper
	42					
	43		CLAYEY SAND (SC); as at 36' except slightly damp; pale yellowish brown (10YR 6/2), dark yellowish brown (10YR 4/2) when wet.			Stopped drilling @ 85 Helper returned String 45'
	44					SL 08 Depth 44.6
	45		SILTY GRAVEL (GM), 25 at 33.2			Commence Drilling @ 45.05
	46		POORLY GRADED SAND WITH GRAVEL (SP); dry, pale yellowish brown (10YR 6/2), dark yellowish brown (10YR 4/2) when wet; about 60% subangular to subangular medium to coarse sand; 40% subangular, hard gravel to 3/4"; trace of clay & fine sand; slightly cemented w/ abundant caliche. firm to v. firm, highly calcareous			Drilling smooth / easy Drilling w/ helper now
	47					Drilling rough
	48					
	49		SILTY GRAVEL (GM), 25 at 33.2			Drilling smooth String 50.1 SL 08 Depth 49.4

ENG FORM 1836
MAR 71

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PROJECT
Cuchillo Negro

HOLE NO.
CN-CH-40

DRILLING LOG		DIVISION Southwest	INSTALLATION Albuquerque District	SHEET 6 OF 9 SHEETS
1. PROJECT Cuchillo Negro		10. SIZE AND TYPE OF BIT 8" hydraulic flight auger		
2. LOCATION (Coordinates or Station) Optional Spillway / Borrow Area		11. DATUM FOR ELEVATION SHOWN (FSM or MSL)		
3. DRILLING AGENCY Western Technologies		12. MANUFACTURER'S DESIGNATION OF DRILL CME - 75		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-40		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>		
5. NAME OF DRILLER Ray Vergeeson		14. TOTAL NUMBER CORE BOXES 2		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER not encountered		
7. THICKNESS OF OVERBURDEN 63 1/2 ft		16. DATE HOLE STARTED 20 April 1989 COMPLETED 20 April 1989		
8. DEPTH DRILLED INTO ROCK 22 23 ft		17. ELEVATION TOP OF HOLE 4725'		
9. TOTAL DEPTH OF HOLE 85 7 ft		18. TOTAL CORE RECOVERY FOR BORING 62 1/2%		
		19. SIGNATURE OF INSPECTOR C. W. [Signature]		

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			as above			
51			POORLY GRADED SAND WITH GRAVEL (SP); dry; light brown (SYR64), med. brown (SYR41) when wet; about 50% fine to coarse, mostly coarse, subangular to sub-rounded sand; 50% subangular, hard gravel to 1/2", firm, unconsolidated, calcareous with abundant calcite (CC)			Drilling smooth and fast
52						
53						
54			scattered thin beds of POORLY GRADED GRAVEL WITH SAND (GP) of about 70% gravel and 25% fine to coarse sand; and WELL GRADED SAND WITH GRAVEL (SW) of about 70% fine to coarse sand and 25% gravel to 2 1/4" throughout boring between 51 1/2 and 57 1/2; trace of highly plastic fat clay throughout (5%)			String 55 1/4 Sul 0 6 Depth 54 1/2
55						
56						drilling smooth and a little slow
57						
58			CLAYEY SAND (SC), dry, light brown (SYR64), about 70% fine to coarse, subangular to sub-rounded sand, 25% highly plastic fat clay, 5% subangular, hard gravel to 1 1/2 inches; firm, slightly cemented, highly calcareous (CC)			
59			POORLY GRADED GRAVEL (GP) multicolored; dry; about 90% subangular to subrounded gravel to 1 1/2 inch, most less than 1 inch; 5% fine to coarse sand, 5% plastic clay, & firm, slightly cemented, calcareous (CC)			drilling slow String 60 1/2 Sul 0 0 Depth 59 1/2

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PROJECT Cuchillo Negro HOLE NO. CN-CH-40

Hole No. CN-CH-40

DRILLING LOG		DIVISION	INSTALLATION	SHEET
Cochillo Negro Damsite		Southwest	Albuquerque District	7 OF 9 SHEETS
1. PROJECT		10. SIZE AND TYPE OF BIT		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL		
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES		
6. DIRECTION OF HOLE		15. ELEVATION GROUND WATER		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE		
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING		
		19. SIGNATURE OF INSPECTOR		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
61			WELL GRADED GRAVEL WITH CLAY AND SAND (GR-GC): dry; multicolored; about 70% subangular to rounded, hard gravel to 2 inches; 20% subangular to subrounded, fine to coarse, mostly fine to medium sand; 10% fat clay (10R4/6); dense to v. dense; slightly cemented; clay is calcareous; most gravel is igneous rock, generally hard. (FC)	100%		try working at 100' feet augers not turning. rig is wedged 3' 30" 0055 commence coring
62			as above includes underite, bander rhyolite, buff, druse, and gls monzonite	100%		Drilling fast and easy
63			TOR			
64			CONGLOMERATE, as above except well cemented moderately weathered; abundant coarse crystalline calcite in matrix (AC)	100%		String 673 Set 34 Depth 632
65			as above except very closely jointed. Breakage is all ornately mechanical.	Run #2 63' 20" 68%	Box #1 63' 45"	At 64', pulled out of hole @ 1045. Very slow advance, steel not falling when raised.
66			most ground composed of igneous rocks.	Correct 12' 50" 34%		1104 Commence Drilling 1130 Drilled to 603, but no cut barrel in. Driller forgot
67			R25 0% 0%		80% water return	
68				3' CL DOZ		Outer barrel recovered 17' of coal gravel
69			as above	LP-03		String 723 Set 34 Depth 682
				Run #3 68' 20" 71' 12' CL DOZ		1226 resume drilling Drilling Smooth

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PROJECT: Cochillo Negro HOLE NO. CIV-CH-40

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT CUCHILLO NEGRO DAM SITE		SWD	ALBUQUERQUE DISTRICT	1 OF 3 SHEETS		
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA		10. SIZE AND TYPE OF BIT 3 5/8" x 5 7/8" ROCKBIT, NX DIA. GCM				
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)		11. DATUM FOR ELEVATION SHOWN (FSL - 281)				
4. HOLE NO. (As shown on drawing title and file number) CN-CH-42		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500				
5. NAME OF DRILLER G. WILLIAMS		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES 1				
7. THICKNESS OF OVERBURDEN 59.5' ±		15. ELEVATION GROUND WATER NOT ENCOUNTERED				
8. DEPTH DRILLED INTO ROCK 38.2' ±		16. DATE HOLE STARTED 28 JUNE 89 COMPLETED 10 JULY 89				
9. TOTAL DEPTH OF HOLE 97.7' ±		17. ELEVATION TOP OF HOLE 4730' ±				
		18. TOTAL CORE RECOVERY FOR BORING 20 %				
		19. SIGNATURE OF INSPECTOR <i>Jackie R. [Signature]</i>				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0.0		0.0' To 1.0' ± GRAVEL: WELL GRADED; (GW) MULTICOLORED; ROUNDED TO SUBANGULAR; LOOSE; DRY; SANDY; MODERATELY SILTY; CALCAREOUS; WITH SCATTERED COBBLES; GRAVEL PREDOM. OF IGNEOUS ORIGIN		8" AUGER	1. NOTE: NO OVER-BURDEN SAMPLES TAKEN FOR TESTING.
			1.0' ± To 9.0' ± GRAVEL: POORLY GRADED; (GP-GC) MULTICOLORED; SUBANGULAR; MEDIUM COMPACTION; DRY; CLAYEY; MODERATELY SANDY; VERY CALCAREOUS; WITH SCATTERED COBBLES; PREDOM. OF IGNEOUS ORIGIN		3 5/8" ROCKBIT	2. DRILLING: 8" FLIGHT AUGER: 0.0' - 5.0' NOTE: SET 4" STEEL CASING TO 5.0' 3 5/8" ROCKBIT WITH BENTONITE DRILL MUD: 5.0' - 20.0' NOTE: BORING WAS CAVING IN TO 7.0' NOTE: REMOVED 4" STEEL CASING & REAMED WITH 10" AUGER TO 15.0' & SET 8" STEEL CASING TO 15.0' 5 7/8" ROCKBIT WITH BENTONITE DRILL MUD: REAMED TO 20.0' & DRILLED TO 39.0' NOTE: SET 4" PVC CASING TO 39.0' & CEMENTED IN PLACE. 3 5/8" ROCKBIT WITH BENTONITE DRILL MUD: 39.0' - 61.5' 2 7/8" NX CORE BARREL WITH DIAMOND BIT: 61.5' - 97.7' NOTE: MATERIAL WAS LOGGED FROM 5.0' - 61.5' BY CUTTINGS & DRILL BIT ACTION.
			9.0' ± To 14.0' ± SAND: FINE TO COARSE; (SC) LIGHT REDDISH BROWN-BROWN; LOOSE-MEDIUM; DRY; MODERATELY CLAYEY & GRAVELLY; CALCAREOUS; WITH SCATTERED COBBLES			
			14.0' ± To 19.0' ± GRAVEL: POORLY GRADED; (GP-GM) SANDY; MODERATELY SILTY; OTHERWISE, SAME AS FROM 1.0' - 9.0' ±			
			19.0' ± To 32.5' ± GRAVEL: POORLY GRADED; (GP) MULTICOLORED; LOOSE-MEDIUM; SANDY; WITH TRACE OF FINES & COBBLES; CALCAREOUS			
			32.5' ± To 46.0' ± GRAVEL: POORLY GRADED; (GP-GM) MULTICOLORED GRAVEL IN A LIGHT REDDISH BROWN SILT BINDER; MEDIUM-DENSE (SLOW DRILLING); SLIGHTLY SANDY; CALCAREOUS			

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
		SOUTHWEST		ALBUQUERQUE DIST.		5 OF 5 SHEETS	
1. PROJECT Cuchillo Negro Dam Site				10. SIZE AND TYPE OF BIT 1 1/2" x 1 1/2" x 1 1/2" diamond			
2. LOCATION (Coordinates or Station) National Spillway/Borrow Area				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY Western Technologies				12. MANUFACTURER'S DESIGNATION OF DRILL CME-75			
4. HOLE NO. (As shown on drawing title and title number) CN-CH-41				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0	
5. NAME OF DRILLER Ray Hansen				14. TOTAL NUMBER CORE BOXES 1		UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER not encountered			
7. THICKNESS OF OVERBURDEN 37 1/2 ft				16. DATE HOLE STARTED 21 April 1989		COMPLETED 22 April 1989	
8. DEPTH DRILLED INTO ROCK 12 1/2 ft				17. ELEVATION TOP OF HOLE 2735'			
9. TOTAL DEPTH OF HOLE 50' ft				18. TOTAL CORE RECOVERY FOR BORING 41 1/2'			
				19. SIGNATURE OF INSPECTOR [Signature]			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			CONGLOMERATE, as above	Run 1 conf 37 1/2 to 42 1/2	Box 1 cont'd	Drilling fast & smooth 60% water recovery	
	41		sand percentage increases with depth.			String 47 3 SL 4 9	
	42		fractures tight & uncoated matrix slightly calcareous			Depth 42 1/2 1625	
			42-2 at 36 1/2	FR 42 1/2		1650 start drilling	
				Run #2 42 1/2 to 46 1/2	37 1/2'	lost water recovery	
	43			Core Rec 0 38 0%	50 1/2'	Drilling fast and smooth	
	44			200 1/38 0%		Drilling very rough	
	45			FR 46 1/2		String 47 3 SL 12 Depth 46 1/2	
	46		CONGLOMERATE, as at 3-5 except abundant caliche.	Run 3 46 1/2 to 50 1/2		1645 end run 1655 begin drilling run 2	
	47			Core Rec 0 4 25%		no water recovery Drilling rough	
	48			200 0%		lost no. of sample trying to retrieve the inner barrel.	
	49			50 1/2		1710 Drill bit stuck String 52 3 SL 23 in 50 1/2	

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PROJECT Cuchillo Negro HOLE NO. CN-CH-41

DRILLING LOG		DIVISION		INSTALLATION		SHEET 4	
SOUTHWEST		ALBUQUERQUE DIST.		OF 5 SHEETS			
1. PROJECT Cuchillo Negro Dam site				10. SIZE AND TYPE OF BIT 1 1/2" High speed flight reamer			
2. LOCATION (Coordinates or Station) Optional Sillway Borrow Area				11. DATUM FOR ELEVATION SHOWN (FSL or MSL) Mx 1000 wireline			
3. DRILLING AGENCY Western Technologies				12. MANUFACTURER'S DESIGNATION OF DRILL CME-75			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-41				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 0		DISTURBED 0	
5. NAME OF DRILLER Ray Bergesen				14. TOTAL NUMBER CORE BOXES 1		15. ELEVATION GROUND WATER not encountered	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE 21 April 1989		STARTED 22 April 1989	
7. THICKNESS OF OVERBURDEN 37' ft				17. ELEVATION TOP OF HOLE 4735'			
8. DEPTH DRILLED INTO ROCK 12' ft				18. TOTAL CORE RECOVERY FOR BORING 41%			
9. TOTAL DEPTH OF HOLE 50' ft				19. SIGNATURE OF INSPECTOR B. D. Dett			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	52		as above	100%	Box B	Drilling very slow and rough Augers getting wedged in hole 1058 - stopped drilling 31' to adjust clutch 1430 4/22/89 Commence Drilling	
	31						
	32						
	33		CLAYEY SAND (SCS) det. not filed pale red (10B6/2) and moderate brown (5YR4/4) about 50-60% fine to coarse, mostly fine to medium, sub-rounded to subangular sand 30-40% high plastic fines; 10% subangular, hard gravel to 1/2" some to 3/4"; moderately cemented; dense, highly calcareous; abundant white			Drilling rough and a little slow	
	34					Drilling 354 at 05 Depth 342.	
	35	50	about 50% sand, 45% clay (10%) trace of gravel	100%	Box #5 42+35	Drilling very slow	
	36					Drilling very slow	
	37		TOE COAGULOMERATE, multicolored to pinkish brown, subangular to rounded, mostly subangular to rounded, fine grained gravel to 1/2 inch (matrix larger) in a matrix of rounded to subangular fine to coarse sand with some 1/16 fines, soft to hard; moderately weathered, v. (loosely) jointed along radial jointed fissures; matrix is calcareous; fractures are rough to v. rough & tight, well to hard well indurated (FC)			Drilling fast & smooth	
	38					50% water recovery	
	39		as above except moderately to highly weathered, primarily soft, gravel is 30% clay is 40% sand is 70%				

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PROJECT Cuchillo Negro HOLE NO. CN-CH-41

DIVISION SOUTHWEST		INSTALLATION ALBUQUERQUE DIST.		SHEET 3 OF 5 SHEETS	
1. PROJECT Cuchillo Negro Dam Site		10. SIZE AND TYPE OF BIT 8" Hollow Stem Flight Auger			
2. LOCATION (Coordinates or Station) Original Sillway / Borrow Area		11. DATUM FOR ELEVATION SHOWN (FSM - MSL)			
3. DRILLING AGENCY Western Technologies		12. MANUFACTURER'S DESIGNATION OF DRILL CME - 75			
4. HOLE NO. (As shown on drawing title and file number) CN-CH 11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/>	
5. NAME OF DRILLER Ray Bergeesen		14. TOTAL NUMBER CORE BOXES			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER		16. DATE HOLE STARTED 21 April 1989 COMPLETED	
7. THICKNESS OF OVERBURDEN 37.8 ft		17. ELEVATION TOP OF HOLE ~ 4735'		18. TOTAL CORE RECOVERY FOR BORING 41%	
8. DEPTH DRILLED INTO ROCK 12.4 ft		19. SIGNATURE OF INSPECTOR <i>[Signature]</i>			
9. TOTAL DEPTH OF HOLE 50.2 ft					

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	20		PORELY GRADED GRAVEL w/ CLAY AND SAND (GP-GC)		FS#6 20' 21'	
	34		as at 13' except 65-75% gravel	50%		
	21					
	22		SANDY FAT CLAY (CH), as at 13'			Drilling fast & smooth
	23					
	24		PORELY GRADED GRAVEL w/ CLAY AND SAND (GP-GC) as at 13' except 70-80% gravel			1015 - SPT String 25' SH 0.9 Depth 24.5'
	52		65 - 75% gravel	100%	FS#7 24.5' 25.0'	
	25					
	26					
	27					Drilling slow and rough
	28		most gravel $\leq \frac{3}{4}$ inch abundant coliche			
	29					
	20		SANDY FAT CLAY (CH) as at 52, except 65-75% clay, 15-25% sand, dry			1032 - SPT String 30.4 SH 0.9 Depth 29.5'
	18				FS#8 30.4' 31.3'	

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MAR 71

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PROJECT **Cuchillo Negro**

HOLE NO.
CN-CH-41

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 5 SHEETS	
1. PROJECT		SOUTHWEST		ALBUQUERQUE DIST.			
2. LOCATION (Coordinates or Station)		Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT		not encountered	
3. DRILLING AGENCY		Western Technologies		11. DATUM FOR ELEVATION SHOWN (FSM or MSL)			
4. HOLE NO. (As shown on drawing title and file number)		CN-CH-41		12. MANUFACTURER'S DESIGNATION OF DRILL		CMF - 75	
5. NAME OF DRILLER		Ray Peterson		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED <input type="checkbox"/> UNDISTURBED <input type="checkbox"/>	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		14. TOTAL NUMBER CORE BOXES		1	
7. THICKNESS OF OVERBURDEN		37 1/2 ft		15. ELEVATION GROUND WATER		not encountered	
8. DEPTH DRILLED INTO ROCK		12 1/2 ft		16. DATE HOLE		STARTED 21 April 1939 COMPLETED 22 April 1939	
9. TOTAL DEPTH OF HOLE		50 ft		17. ELEVATION TOP OF HOLE		x 4735	
				18. TOTAL CORE RECOVERY FOR BORING		41 1/2	
				19. SIGNATURE OF INSPECTOR		[Signature]	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
	31		as above	70%	FS#3		
	50				95 to 112		
	12		10-15% subangular to subrounded gravel to 3/4 inch			Drilling smooth and fast	
	14		POORLY GRADED GRAVEL WITH CLAY AND SAND (G'-GC); dry grayish orange pink (5YR 7/2); pale brown (5YR 5/2) when wet; about 50% subangular to sub rounded, hard, mostly igneous gravel to 1 1/2 inch, most less than 1 inch; 30% med. to high plastic fines; 20% subangular to subrounded fine to coarse sand; noncemented to slightly cemented, dense, calcareous (Cf.)			5042 - SPT String 154 SU 02 Depth 142	
	15	31		70%	FS#4		
	16	55			145 to 155	Drilling smooth and fast	
	18		SANDY FAT CLAY (CH), ss				
	19		ss 120			1002 - SPT String 202 SU 03 Depth 195	
	18	10			FS#5		

DRILLING LOG	DIVISION	SOUTHWEST	INSTALLATION	ALBUQUERQUE DIST.	SHEET 1 OF 5 SHEETS
1. PROJECT Cuchillo Negro Dam Site			10. SIZE AND TYPE OF BIT 6" hollow stem flight auger		
2. LOCATION (Coordinates or Station) Cultural Spillway / Borrow Area			11. DATUM FOR ELEVATION SHOWN (TBM or BBL)		
3. DRILLING AGENCY Western Technologies			12. MANUFACTURER'S DESIGNATION OF DRILL CMF -75		
4. HOLE NO. (As shown on drawing title and file number) CN-CH-41			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		14. DISTURBED
			0		0
5. NAME OF DRILLER Ray, Deisenen			15. TOTAL NUMBER CORE BOXES 1		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			16. ELEVATION GROUND WATER 1st encountered		
7. THICKNESS OF OVERBURDEN 376 ft			17. DATE HOLE		
8. DEPTH DRILLED INTO ROCK 12 1/2 ft			STARTED 21 April 1989 COMPLETED 22 April 1989		
9. TOTAL DEPTH OF HOLE 502 1/2 ft			18. ELEVATION TOP OF HOLE ~ 4735'		
			19. TOTAL CORE RECOVERY FOR BORING 41%		
			20. SIGNATURE OF INSPECTOR [Signature]		

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MOLE NO.
UN CH-1

DRILLING LOG		DIVISION		INSTALLATION		SHEET 9	
1. PROJECT		South west		Albuquerque District		OF 9 SHEETS	
2. LOCATION (Coordinates of location)		Cuchillo Negro Dam site		10. SIZE AND TYPE OF BIT		1 1/2" wireline diamond core	
3. DRILLING AGENCY		Optional Spillway / Borrow area		11. DAYUM FOR ELEVATION SHOWN (FSM - 1981)			
4. HOLE NO. (As shown on drawing title and title number)		CH-CN-40		12. MANUFACTURER'S DESIGNATION OF DRILL		CME-75	
5. NAME OF DRILLER		Ray Pergeen		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES		2	
7. THICKNESS OF OVERBURDEN		63 45 ft		15. ELEVATION GROUND WATER		Not encountered	
8. DEPTH DRILLED INTO ROCK		22 25 ft		16. DATE HOLE		STARTED 20 April 1989 COMPLETED 20 April 1989	
9. TOTAL DEPTH OF HOLE		65 2 ft		17. ELEVATION TOP OF HOLE		2472.5'	
				18. TOTAL CORE RECOVERY FOR BORING		62 2 %	
				19. SIGNATURE OF INSPECTOR		Christopher B. Onett	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			as above	Run #5	Box 82	1635 Complete run #5	
				cont'd	cont'd	String 82 2	
				FR 802		SL 1 1/2	
						Depth 802	
				Run #6	792	1655 - commence coring run #6	
				802	to		
				to	852		
				852		10% water return	
				core recovery	4 1/2 %		
			bottom 16 foot contains abundant white crystalline calcite oriented with bedding	64 %		Drilling fast and smooth	
			open, 1/2", Fe stained clay and calcite, rough	100			
				22 %			
				40 %			
			SANDY LIMESTONE, pale yellowish brown (10YR 6/2), v. fine to medium grained, composed of approx 20-30% subrounded to rounded Qtz, and little grains in v. fine limestone matrix; mod. soft to mod. hard, unweathered; closely jointed; contains thin randomly oriented calcite seams, three 1/8 inch calcite seams at 70° from the core axis; bedding non-determinable; zones of higher sand content scattered throughout (FC)	40 %	LP-048		
				26 02			
				between 61/1837		1715 - finished drilling run #6	
				FR 852		String 87 2	
						SL 1 1/2	
						Depth 852	
			BO.H. 852				
			tight, coated with calcite and mno blebs, slightly rough				

DRILLING LOG		DIVISION		INSTALLATION		Hole No. <u>CU-CN-40</u>		SHEET <u>8</u> OF <u>9</u> SHEETS	
1. PROJECT <u>Cuchillo Negro Dam site</u>		2. LOCATION (Coordinates or Station) <u>Option Spillway/Borrow Area</u>		10. SIZE AND TYPE OF BIT <u>1 1/2" Dia. Double Core/insert</u>		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
3. DRILLING AGENCY <u>Western Technology</u>		12. MANUFACTURER'S DESIGNATION OF DRILL <u>CME 75</u>		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED		UNDISTURBED	
4. HOLE NO. (As shown on drawing title and file number) <u>CU-CN-40</u>		14. TOTAL NUMBER CORE BOXES <u>2</u>		15. ELEVATION GROUND WATER		<u>not encountered</u>			
5. NAME OF DRILLER <u>R. Perazson</u>		16. DATE HOLE		STARTED		COMPLETED			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		17. ELEVATION TOP OF HOLE <u>4725'</u>		18. TOTAL CORE RECOVERY FOR BORING <u>62 3/4'</u>		19. SIGNATURE OF INSPECTOR <u>Christopher J. DeWitt</u>			
7. THICKNESS OF OVERBURDEN <u>63 1/2' ft.</u>		8. DEPTH DRILLED INTO ROCK <u>27 23' ft.</u>		9. TOTAL DEPTH OF HOLE <u>85 1/2' ft.</u>					
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	2 CORE RECOVER- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g			
			<u>LENGUENEGATE, 26 above</u>	<u>Run #3 Cont'd Core Rec 5/23 22.7% RQD 0%</u>	<u>301 #1 Cont'd</u>	<u>1241 finish run #3</u> <u>String 72 3/4'</u> <u>Su 13</u> <u>Depth 71 1/2'</u>			
	71			<u>Run #4 71 1/2' to 75 1/2'</u>		<u>1300 start run #4</u>			
	72			<u>Core Rec 173 42 42 1/2' LP 0.43</u>		<u>drilling a little rough and slow</u>			
	73			<u>RQD 74 1/2' 0%</u>		<u>drilling smooth and slow</u> <u>50% water return;</u>			
	74			<u>CL 265 Run #5 71 1/2' and 74 25'</u>	<u>63 45 to 79 1/2'</u>	<u>Drilling a little rough and slow</u> <u>drill water changed color</u> <u>Drilling smooth and slow</u> <u>1300 finish run #4</u> <u>String 77 3/4'</u> <u>Su 16</u> <u>Depth 75 1/2'</u>			
	75		<u>interstratified BRECCIA; composed of angular to subangular fragments of mod soft, brownish gray (5YR4/1) limestone to 1/2 inch in soft matrix of highly calcareous, grayish pink (SR 6 1/2) sand and silt; moderately weathered, closely jointed; dry; slightly to moderately weathered (K)</u>			<u>1405 commence Drilling Run #5</u>			
	76		<u>④ open, 1/8 inch fep stained clay, rough at 60' from core axis</u> <u>LIMESTONE, brownish gray (5YR4/1); very fine grained micritic limestone; mod soft to mod hard, slightly weathered, close to mod close jointed, scattered thin, randomly oriented calcite fractures throughout; lower contact sharp at 70' from the core axis (R)</u>	<u>Run #5 75 1/2' to 80 1/2'</u>		<u>Note core was recovered as one piece except top 0.4' all breakage occurred transferring to core box</u> <u>Drilling smooth</u>			
	77		<u>⑤ mechanical break on 1/2" wide calcite vein with 1/2" from core axis</u> <u>INTERSTRATIFIED BRECCIA, 23 at 74 25', except moderately to highly weathered, thinly interbedded with SILTY SANDSTONE; grayish orange (10YR 7/4); composed of 75-85% fine grained sub-angular silt and ls. grains, 15-25% silt; soft. Scattered MnO blebs in silt; slightly calcareous w/ highly calcareous zones; contacts are sharp; bedding somewhat variable at 60' to 75' from the core axis (K)</u>	<u>Core Break 59 50 100 40 LP 0.0</u>		<u>60% water return</u>			
	78			<u>RQD 18 1/2' 15 1/2' 27%</u>					
	79		<u>scattered v. soft zones</u>						

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PROJECT Cuchillo Negro HOLE NO. CU-CN-40

DRILLING LOG		DIVISION	INSTALLATION	SHEET 2 OF 3 SHEETS		
1. PROJECT CUCHILLO NEGRO DAM SITE		SWD	ALBUQUERQUE DISTRICT			
2. LOCATION (Coordinates or Station) OPTIONAL SPILLW' / BORROW AREA		10. SIZE AND TYPE OF BIT 3 5/8" 57/8" ROCKBIT, NX DIA GEE				
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)		11. DATUM FOR ELEVATION SHOWN (TBM or BSL)				
4. HOLE NO. (As shown on drawing title and file number) CN-CH-42		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500				
5. NAME OF DRILLER G. WILLIAMS		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES 1				
7. THICKNESS OF OVERBURDEN 59.5'		15. ELEVATION GROUND WATER NOT ENCOUNTERED				
8. DEPTH DRILLED INTO ROCK 38.2'		16. DATE HOLE 28 JUN '59 STARTED 10 JULY 59 COMPLETED				
9. TOTAL DEPTH OF HOLE 97.7'		17. ELEVATION TOP OF HOLE 4730 ±				
		18. TOTAL CORE RECOVERY FOR BORIT. 20 %				
		19. SIGNATURE OF INSPECTOR <i>James R. P. [Signature]</i>				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			41.0' - 43.0': LESS GRAVEL & INCREASE IN SAND			NOTE: 95% DRILL FLUID RECOVERY WITH BENTONITE DRILL MUD WHILE ROCKBITTING TO 61.5'
			43.0' - 46.0': INCREASE IN GRAVEL & COBBLES			
			46.0' ± TO 49.0' ± SAND: POORLY GRADED; LIGHT REDDISH BROWN; GRAVELLY; CALCAREOUS; SLIGHTLY SILTY	(SP)	3 5/8" ROCKBIT	
			49.0' ± TO 55.5' ± GRAVEL: POORLY GRADED; MULTICOLORED; SLIGHTLY SANDY; WITH TRACE OF FINES; CALCAREOUS	(GP)		
			55.5' ± TO 59.5' ± SAND: POORLY GRADED; CLAYEY; LIGHT REDDISH BROWN, WITH SCATTERED GRAVEL; CALCAREOUS	(SC)		
			59.5' ± TO 95.8' CONGLOMERATE: MULTI- COLORED; THIN MOD. HARD, MODERATELY CE- MENTED SAND & GRAVEL IN A CALCITE & CaCO₃ MATRIX INTERBEDDED WITH SOFT, GRAVELLY, SANDY CLAY (REDDISH BROWN); POOR CORE RECOVERY INDICATES VERY WEAK CEMENTATION IN MUCH OF CONGLOM- ERATE; CONTAINS COBBLES OF IGNEOUS ORIGIN			NOTE: DUE TO WEAK CE- MENTATION OF MUCH OF THE CONGLOMERATE ZONE, THE TOP OF THE ZONE IS DIFFICULT TO DETERMINE WHILE ROCKBITTING.
				61.5		NOTE: VERY POOR CORE RECOVERY IN CON- GLOMERATE FROM 61.5' - 95.8'
				L: 8.0' REC. 13%		NOTE: 90% DRILL FLUID RETURN WITH THIN DRILL MUD IN CORING CO. - GLOMERATE ZONE.
				70.7	Box 1	
				L: 6.7' REC. 9%		
				78.0		

Hole No. CN-CH-42

DRILLING LOG		DIVISION		INSTALLATION		SHEET 3 OF 3 SHEETS	
1. PROJECT CUCHILLO NEGRO DAM SITE				10. SIZE AND TYPE OF BIT 3 5/8" x 5 7/8" ROCK BIT - NIKDIA GORE			
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA				11. DATUM FOR ELEVATION SHOWN (TBM or BSL)			
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)				12. MANUFACTURER'S DESIGNATION OF DRILL FALLING 1500			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-42				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0	
5. NAME OF DRILLER G. WILLIAMS				14. TOTAL NUMBER CORE BOXES		UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT				15. ELEVATION GROUND WATER		NOT ENCOUNTERED	
7. THICKNESS OF OVERBURDEN 59.5' ±				16. DATE HOLE		STARTED 28 JUNE 87 COMPLETED 10 JULY 89	
8. DEPTH DRILLED INTO ROCK 38.2' ±				17. ELEVATION TOP OF HOLE		4730' ±	
9. TOTAL DEPTH OF HOLE 97.7'				18. TOTAL CORE RECOVERY FOR BORING		20 %	
				19. SIGNATURE OF INSPECTOR Jack R. Allen			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
				4:3.2 REL. 36%			
				83.0			
			83.3' - 92.0': ABUNDANT REDDISH BROWN SANDY GRAVELLY CLAY; (DIFFICULT TO REMOVE FROM CORE BARREL)	4:7.2 REL. 20%	Box 1		
				92.0			
				4:3.7 REL. 35%			
	95.8		95.8' to 97.7' T.D.	97.7			
	97.7		LIMESTONE: SLIGHTLY WEATHERED; LIGHT BROWNISH GRAY TO LIGHT BLuish GRAY WITH LIGHT RED WHEN WET. DRIES TO A WHITE-LIGHT GRAY; HARD-VERY HARD; DENSE; WELL CEMENTED; MICROCRYSTALLINE; BEDDING UNDETERMINED; WITH SCATTERED CALCITE FRACTURES; MECHANICAL BREAKAGE AT TOP OF FORMATION T.D. 97.7'				NOTE: LOST TOTAL CIRCULATION AT 96.9'
	100						
	120						

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PROJECT, CUCHILLO NEGRO

HOLE NO. CN-CH-42

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT CUCHILLO NEGRO DAM SITE		SWD	ALBUQUERQUE DISTRICT	1 OF 4 SHEETS		
2. LOCATION (Coordinates or Station)			10. SIZE AND TYPE OF BIT 3 7/8" x 5 1/8" ROCKBIT, NX DIA.			
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)			11. DATUM FOR ELEVATION SHOWN (FTH - MSL)			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-43			12. MANUFACTURER'S DESIGNATION OF DRILL FALLING 1500			
5. NAME OF DRILLER G. WILLIAMS			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			DISTURBED 0 UNDISTURBED 0			
7. THICKNESS OF OVERBURDEN 74.0' ±			14. TOTAL NUMBER CORE BOXES 1			
8. DEPTH DRILLED INTO ROCK 65.5' ±			15. ELEVATION GROUND WATER NOT ENCOUNTERED			
9. TOTAL DEPTH OF HOLE 139.5'			16. DATE HOLE 10 JULY 89 13 JULY 89			
			17. ELEVATION TOP OF HOLE 4744' ±			
			18. TOTAL CORE RECOVERY FOR BORING 37 %			
			19. SIGNATURE OF INSPECTOR J. K. Williams			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0.0		0.0' To 8.0' ± CLAY: LOW-MEDIUM PLASTICITY; LIGHT REDDISH BROWN; DRY; VERY STIFF-HARD; VERY CALCAREOUS; SILTY; MODERATELY SANDY; VERY GRAVELLY WITH SCATTERED COBBLES & BOULDERS TO 12" DIA. (CL)			1. NOTE: NO OVER-BURDEN SAMPLES TAKEN FOR TESTING.
			8.0' ± To 10.0' ± SAND: FINE-MEDIUM; LIGHT REDDISH BROWN; DRY; SILTY; CALCAREOUS; WITH SCATTERED GRAVEL (SM)			2. DRILLING: 10" FLIGHT AUGER: 0.0' - 5.0' NOTE: SET 8" STEEL CASING TO 5.0' 6" DENISON BARREL: 5.0' - 6.0' NOTE: SAMPLE WAS DISTURBED & WASHED AWAY DUE TO GRAVEL NOTE: REMOVED 8" CASING 10" FLIGHT AUGER: 6.0' - 12.0' NOTE: RESET 8" STEEL CASING TO 12.0' 5 7/8" ROCKBIT WITH BENTONITE DRILL MUD: 12.0' - 59.5' NOTE: HAD 95% OF DRILL FLUID RETURN. 2 7/8" NX CORE BARREL WITH DIAMOND BIT: 59.5' - 62.7' 3 5/8" ROCKBIT WITH BENTONITE DRILL MUD: 62.7' - 89.9' NOTE: HAD 90% OF DRILL FLUID RETURN. 2 7/8" NX CORE BARREL WITH DIAMOND BIT: 89.9' - 97.0' 3 5/8" ROCKBIT WITH BENTONITE DRILL MUD: 97.0' - 139.5' NOTE: HAD 90% OF DRILL FLUID RETURN. NOTE: MATERIAL DRILLED BY ROCKBIT WAS LOGGED BY CUTTING & DRILL BIT ACTION.
			10.0' ± To 12.0' ± CLAY: LOW-MEDIUM PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; CALCAREOUS; SANDY; GRAVELLY (CL)			
			12.0' ± To 17.0' ± GRAVEL: POORLY GRADED; MULTICOLORED; (STRONG ROCKBIT CHATTER); DRY; SANDY; SILTY; CALCAREOUS; WITH COBBLES; GRAVEL & COBBLES ARE SUBANGULAR & OF IGNEOUS ORIGIN (GM)			
			17.0' ± To 19.5' ± SAND: FINE-MEDIUM; LIGHT REDDISH BROWN; DENSE; CALCAREOUS; CLAYEY; WITH THIN GRAVEL LAYER AT 19.2' (SC)			
			19.5' ± To 29.2' ± CLAY: MEDIUM-HIGH PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; CALCAREOUS; MODERATELY SILTY; WITH GRAVEL LAYER AT 27.5' (CH)			
			29.2' ± To 33.0' ± GRAVEL: SAME AS FROM 12.0' ± - 17.0' ±; (STRONG ROCKBIT CHATTER) (GM)			
			33.0' ± To 37.5' ± CLAY: SAME AS FROM 19.5' ± - 29.2' ±; WITH SCATTERED GRAVEL (CH)			
			37.5' ± To 45.0' ± GRAVEL: MULTICOLORED; CLAYEY; CALCAREOUS; WITH TRACE OF SAND (GC)			

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2	
		SWD		ALBUQUERQUE DISTRICT		OF 4 SHEETS	
1. PROJECT CUCHILLO NEGRO DAM SITE				10. SIZE AND TYPE OF BIT 3 1/8" & 5 1/8" ROCKBIT, NX DIA.			
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA				11. DATUM FOR ELEVATION SHOWN (FSL or MSL)			
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)				12. MANUFACTURER'S DESIGNATION OF DRILL FALING 1500			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-43				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0 UNDISTURBED 0	
5. NAME OF DRILLER G. WILLIAMS				14. TOTAL NUMBER CORE BOXES 1		15. ELEVATION GROUND WATER NOT ENCOUNTERED	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				16. DATE HOLE STARTED 10 JULY 89 COMPLETED 13 JULY 89			
7. THICKNESS OF OVERBURDEN 74.0' ±				17. ELEVATION TOP OF HOLE 4744' ±			
8. DEPTH DRILLED INTO ROCK 65.5' ±				18. TOTAL CORE RECOVERY FOR BORING 37 %			
9. TOTAL DEPTH OF HOLE 139.5'				19. SIGNATURE OF INSPECTOR <i>James R. Hoban</i>			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			45.0' ± to 70.0' ± GRAVEL: POORLY GRADED; (GP-GC) MULTICOLORED; DENSE; (STRONG DRILL CHATTER); CLAYEY, WITH LIGHT REDDISH BROWN CAL- CAREOUS CLAY BINDER; SLIGHTLY SANDY			NOTE: HAD 95% OF DRILL FLUID RETURN IN ROCKBIT DRILLING TO 59.5'	
	60		NOTE: RECOVERED ONLY WASHED GRAVEL; RECOVER- ED NO MATERIAL WHICH INDICATED CEMENTATION	59.5 L: 2.2 REC: 31%	Box 1	NOTE: HAD 50% OF DRILL FLUID RETURN IN CORING FROM 59.5'- 62.7'	
			70.0' ± to 74.0' ± GRAVEL: SAME AS FROM 37.5' ± - 45.0' ±	62.7		NOTE: DUE TO WEAK CE- MENTATION OF MUCH OF THE CONGLOMERATE ZONE, THE TOP OF THE ZONE IS DIFFICULT TO DETERMINE WHILE ROCKBITTING.	
	74.0		74.0' ± to 138.0' ± CONGLOMERATE: MULTI- COLORED; THIN MOD. HARD, MOD. CEMENTED. WEATHERED SEAMS OF FINE-MEDIUM GRAVEL & SAND INTERBEDDED WITH SOFT WEAKLY CEMENTED SEAMS OF		3 1/8" ROCKBIT	NOTE: HAD 90% OF DRILL FLUID RETURN IN ROCKBIT DRILLING FROM 62.7' - 89.9'	

FNG. FORM 10-76 (REVISIONS SEE REVERSE)

PROJECT -

HOLE NO.

DRILLING LOG		DIVISION	INSTALLATION		SHEET 3 OF 4 SHEETS	
1. PROJECT CUCHILLO NEGRO DAM SITE			10. SIZE AND TYPE OF BIT 3 1/8" & 5 1/8" ROCKBIT - N.A.M.A.			
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA			11. DATUM FOR ELEVATION KNOWN (F.T. or M.L.)			
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)			12. MANUFACTURER'S DESIGNATION OF DRILL FAIRING 1500			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-43			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0			
5. NAME OF DRILLER G. WILLIAMS			14. TOTAL NUMBER CORE BOXES 1			
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER NOT ENCOUNTERED			
7. THICKNESS OF OVERBURDEN 74.0' ±			16. DATE HOLE STARTED 10 JULY 89 COMPLETED 13 JULY 89			
8. DEPTH DRILLED INTO ROCK 65.5' ±			17. ELEVATION TOP OF HOLE 4744' ±			
9. TOTAL DEPTH OF HOLE 139.5'			18. TOTAL CORE RECOVERY FOR BORING 37%			
			19. SIGNATURE OF INSPECTOR <i>Jack R. Hobbs</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		BADLY WEATHERED, LIGHT REDDISH BROWN SANDY CLAY, WITH CALCAREOUS MATRIX & SCATTERED FRACTURES			
	89.9		89.9'-90.2': MOD. HARD CEMENTED FINE-MEDIUM GRAVEL & SAND IN A CALCITE MATRIX	89.9'		
	92.0		92.0'-93.0': L.S. COBBLES & BOULDERS	93.0'	Box 1	NOTE: HAD 75% OF DRILL FLUID RETURN IN CORING FROM 89.9'-97.0'
	96.0		96.0'-97.0': SAME AS FROM 89.9'-90.2'	97.0'		
	102.0		102.0': SOFT CLAYEY SEAM			
	108.0		108.0': SOFT CLAYEY SEAM			NOTE: HAD 90% OF DRILL FLUID RETURN IN ROCKBIT DRILLING FROM 97.0' - 139.5'
	115.0		115.0': SCATTERED COBBLES, (STRONG CHATTER - ROUGH DRILLING)			
	120.0					

DRILLING LOG		DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
1. PROJECT CUCHILLO NEGRO DAM SITE		SWD	ALBUQUERQUE DISTRICT	
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA			10. SIZE AND TYPE OF BIT 3 5/8" ROCKBIT; NX CORE (DIA.)	
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)			11. DAYTIME FOR ELEVATION SHOWN (TBM or BBL)	
4. HOLE NO. (As shown on drawing title and file number) CN-CH-44			12. MANUFACTURER'S DESIGNATION OF DRILL FALLING 1500	
5. NAME OF DRILLER G. WILLIAMS			13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			14. TOTAL NUMBER CORE BOXES 1	
7. THICKNESS OF OVERBURDEN 46.0' ±			15. ELEVATION GROUND WATER NOT ENCOUNTERED	
8. DEPTH DRILLED INTO ROCK 24.0' ±			16. DATE HOLE STARTED _____ COMPLETED 26 JUNE 89; 28 JUNE 89	
9. TOTAL DEPTH OF HOLE 70.0'			17. ELEVATION TOP OF HOLE 4718' ±	
			18. TOTAL CORE RECOVERY FOR BORING 35 %	
			19. SIGNATURE OF INSPECTOR <i>Jack R. [Signature]</i>	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0.0		0.0' TO 0.9' ± GRAVEL: WELL GRADED; (GW-GC) ROUNDED TO SUBANGULAR; MULTICOLORED; LOOSE; DRY; MODERATELY CLAYEY & SANDY; CALCAREOUS; WITH SCATTERED COBBLES; GRAVEL PREDOM. OF IGNEOUS ORIGIN			1. NOTE: NO OVER-BURDEN SAMPLES TAKEN FOR TESTING 2. DRILLING: 8" FLIGHT AUGER: 0.0' - 7.0' NOTE: SET 4" STEEL CASING TO 7.0' 3 5/8" ROCKBIT: 7.0' - 50.0' NOTE: USED BENTONITE DRILL MUD 2 7/8" NX CORE BARREL WITH DIAMOND BIT: 50.0' - 70.0' NOTE: MATERIAL WAS LOGGED FROM 7.0' ± TO 50.0' ± BY CUTTINGS & DRILL BIT ACTION.
			0.9' ± TO 4.0' ± CLAY: MEDIUM-HIGH PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; CALCAREOUS; WITH TRACE OF FINE SAND & GRAVEL (CH)			
			4.0' ± TO 9.0' ± GRAVEL: POORLY GRADED; OTHERWISE SAME AS FROM 0.0' - 0.9' ± (GP-GC)			
			9.0' ± TO 16.0' ± CLAY: LOW-MEDIUM PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; VERY CALCAREOUS; MODERATELY SANDY & GRAVELLY (CL)			
			16.0' ± TO 23.0' ± GRAVEL: SAME AS 4.0' ± - 9.0' ± (GP-GC)			
			23.0' ± TO 25.0' ± CLAY: MEDIUM-HIGH PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; CALCAREOUS; WITH TRACE OF SAND (CH)			
			25.0' ± TO 30.0' ± GRAVEL: SAME AS FROM 16.0' ± - 23.0' ± (GP-GC)			
			30.0' ± TO 39.5' ± CLAYEY SAND/SANDY CLAY (SC-CL) LIGHT REDDISH BROWN; HARD; DRY; VERY CALCAREOUS; WITH SCATTERED GRAVEL LAYERS			
			39.5' ± TO 46.0' ±			

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PROJECT
CUCHILLO NEGRO

HOLE NO.
CN-CH-44

DRILLING LOG		DIVISION		INSTALLATION		SHEET	
SWD		ALBUQUERQUE DISTRICT		2		OF 2 SHEETS	
1. PROJECT CUCHILLO NEGRO DAM SITE				10. SIZE AND TYPE OF BIT 3 3/8 ROCKBIT-NX CORE (DIA)			
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA				11. DATUM FOR ELEVATION SHOWN (FSL - MSL)			
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)				12. MANUFACTURER'S DESIGNATION OF DRILL FALLING 1500			
4. HOLE NO. (As shown on drawing title and file number) CN-CH-44				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED 0	
5. NAME OF DRILLER G. WILLIAMS				14. TOTAL NUMBER CORE BOXES		UNDISTURBED 0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER NOT ENCOUNTERED			
7. THICKNESS OF OVERBURDEN 46.0' ±				16. DATE HOLE		STARTED 26 JUNE 89 COMPLETED 28 JUNE 89	
8. DEPTH DRILLED INTO ROCK 24.0' ±				17. ELEVATION TOP OF HOLE 4718'		18. TOTAL CORE RECOVERY FOR BORING 35 %	
9. TOTAL DEPTH OF HOLE 70.0'				19. SIGNATURE OF INSPECTOR James R. [Signature]			
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIAL (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			SAND: MEDIUM-COARSE; MULTICOLORED; MEDIUM COMPACTION; GRAVELLY; CALCAREOUS; WITH SMALL AMOUNT OF LIGHT REDDISH BROWN SILTY CLAY	(SP)		NOTE: 100% DRILL FLUID RECOVERY WITH BENTONITE DRILL MUD WHILE ROCK BITTING TO 50.0.	
	46.0		46.0' ± TO 59.7'				
			CONGLOMERATE: MULTI-COLORED; THIN HARD WELL CEMENTED MODERATELY WEATHERED SEAMS WITH FINE GRAVEL & MEDIUM-COARSE SAND INTER-BEDDED WITH SOFT WEAKLY CEMENTED, BADLY WEATHERED SEAMS OF LIGHT REDDISH BROWN SAND & CLAY; WITH CALCAREOUS MATRIX & SCATTERED ROUGH FRACTURES (POOR CORE RECOVERY)		50.0	NOTE: VERY POOR CORE RECOVERY IN CONGLOMERATE FROM 50.0' - 59.7'	
					L: 5.0' REC. 16.7'		
					56.0	NOTE: LOST 3.0' OF CORE IN CONGLOMERATE FROM 56.0' - 59.7'	
	59.7		59.7 TO 70.0 T.D.		L: 5.0' REC. 29.7'	NOTE: LOST CORE FROM 60.7' - 62.6' & 63.4' - 64.2' & 64.6' - 65.6'	
			LIMESTONE: PREDOM. SLIGHTLY WEATHERED TO UNWEATHERED WITH SCATTERED BADLY WEATHERED, VERY SOFT, LIGHT REDDISH BROWN SILTY SANDSTONE (WASHED AWAY); GRAY WITH RED WHEN WET; DRIES TO LIGHT GRAY; HARD - VERY HARD EXCEPT AS NOTED; DENSE; WELL CEMENTED; MICROCRYSTALLINE; BEDDING UNDETERMINED; WITH SCATTERED CEMENTED FRACTURES; WITH SOME SOLUTIONING & HONEY-COMBED STRUCTURE AT 60.7' (LOST TOTAL CIRCULATION); WELL DEVELOPED CEMENTED FRACTURES AT 62.6', 63.0', 63.4', 66.6', 67.0', 67.7', 68.2', 68.9' & 69.1' - 70.0'		63.0	NOTE: LOST CORE FROM 66.1' - 66.6' & 67.0' - 67.7'	
					L: 3.0' REC. 43.7'	NOTE: DID NOT RECOVER DRILL FLUID CIRCULATION IN CORING FROM 60.7' - 70.0'	
					70.0		
	70.0		T.D. 70.0'				

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
		SWD	ALBUQUERQUE DISTRICT	1 OF 3 SHEETS		
1. PROJECT CUCHILLO NEGRO DAM SITE		10. SIZE AND TYPE OF BIT 3 5/8" ROCKBIT-NX NIA CORE				
2. LOCATION (Coordinates or Station) OPTIONAL SPILLWAY/BORROW AREA		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)				
3. DRILLING AGENCY USCE (FT. WORTH DISTRICT)		12. MANUFACTURER'S DESIGNATION OF DRILL FALING 1500				
4. HOLE NO. (As shown on drawing title and file number) CN-CH-45		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 0 UNDISTURBED 0				
5. NAME OF DRILLER G. WILLIAMS		14. TOTAL NUMBER CORE BOXES 1				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER NOT ENCOUNTERED				
7. THICKNESS OF OVERBURDEN 45.0' ±		16. DATE HOLE STARTED 14 JULY 89 COMPLETED 18 JULY 89				
8. DEPTH DRILLED INTO ROCK 65.0' ±		17. ELEVATION TOP OF HOLE 4726' ±				
9. TOTAL DEPTH OF HOLE 110.0'		18. TOTAL CORE RECOVERY FOR BORING 21 ±				
		19. SIGNATURE OF INSPECTOR JACKIE R. HOBBS				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0.0		0.0' To 1.2' ± GRAVEL: WELL GRADED; (GW) ROUNDED TO SUBANGULAR; MULTICOLORED; LOOSE; DRY; MODERATELY CLAYEY; SANDY; CALCAREOUS; WITH SCATTERED COBBLES; GRAVEL PREDOM. OF IGNEOUS ORIGIN			1. NOTE: NO OVER-BURDEN SAMPLES TAKEN FOR TESTING.
			1.2' ± To 6.0' ± GRAVEL: POORLY GRADED (GP-GC) CLAYEY; WITH ABUNDANT LIME MATTER; MEDIUM COMPACTION; OTHERWISE, SAME AS ABOVE			2. DRILLING: 10" FLIGHT AUGER: 0.0' - 11.0' NOTE: SET 8" STEEL CASING TO 11.0' 3 5/8" ROCKBIT WITH BENTONITE DRILL MUD: 11.0' - 50.0' NOTE: HAD 95% OF DRILL FLUID RETURN. 2 7/8" NX CORE BARREL WITH DIAMOND BIT: 50.0' - 110.0' NOTE: HAD 25% OF DRILL WATER RETURN FROM 51.5' - 93.0' NOTE: HAD 80% OF DRILL WATER RETURN FROM 93.0' - 110.0' NOTE: MATERIAL DRILLED BY ROCKBIT WAS LOST BY CUTTINGS & DRILL BIT ACTION.
	20		6.0' ± To 17.8' ± CLAY: LOW-MEDIUM PLAS- TICITY; LIGHT REDDISH BROWN; HARD; DRY; SANDY; GRAVELLY; VERY CALCAREOUS; WITH COBBLES			
			17.8' ± To 20.0' ± GRAVEL: POORLY GRADED; (GP-GC) OTHERWISE SAME AS FROM 0.0' - 1.2' ±			
			20.0' ± To 28.0' ± CLAY: MEDIUM-HIGH PLASTICITY; LIGHT REDDISH BROWN; HARD; DRY; CALCAREOUS; SLIGHTLY SANDY			
			28.0' ± To 37.0' ± GRAVEL: POORLY GRADED; (GP-GC) SAME AS FROM 1.2' ± - 6.0' ±			
			37.0' ± To 45.0' ± CLAY: LOW PLASTICITY; (CL) LIGHT REDDISH BROWN; HARD; DRY; VERY CALCAREOUS; WITH SCATTERED GRAVEL			

DRILLING LOG		DIVISION	INSTALLATION	SHEET
		SWD	ALBUQUERQUE DISTRICT	3
1. PROJECT		10. SIZE AND TYPE OF BIT		
CUCHILLO NEGRO DAM SITE		3 3/8" ROCK BIT - 1/2" DIA. CORE		
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)		
OPTIONAL SPILLWAY/BORROW AREA				
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL		
USCE (FT. WORTH DISTRICT)		FALLING 1500		
4. HOLE NO. (See shown on drawing title and file number)		13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		
CN-CH-45		DISTURBED 0 UNDISTURBED 0		
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES		
G. WILLIAMS		1		
6. DIRECTION OF HOLE		15. ELEVATION GROUND WATER		
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG FROM VERT.		NOT ENCOUNTERED		
7. THICKNESS OF OVERBURDEN		16. DATE HOLE		
45.0' ±		STARTED 14 JULY 89 COMPLETED 18 JULY 89		
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE		
65.0' ±		4726' ±		
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING		
110.0'		21%		
		19. SIGNATURE OF INSPECTOR		
		J. R. STEVENSON		

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
			SAME AS ABOVE: THIN HARD CEMENTED SEAMS INTERBEDDED WITH SOFT WEAKLY CEMENTED SANDY CLAY.	L: 4.0' REC. 20%		
				83.5		
			85.8' DENSE GRAVEL	L: 5.0' REC. 16%		
				89.5		
			92.0' - 94.0' SOFT, CLAYEY			
					Box 1	
				L: 18.5' REC. 97%		
			102.8' - 103.6' SOFT, CLAYEY			
						NOTE: HAD 80% ± DRILL WATER RETURN FROM 93.0' - 110.0'
			108.8' TO 110.0' T.D.			
			LIMESTONE: ESSENTIALLY UNWEATHERED: GRAY WITH RED WHEN WET - DRIES TO LIGHT GRAY; HARD - VERY HARD; MICRO- CRYSTALLINE T.D. 110.0'			
						NOTE: HAD GOOD CORE RECOVERY IN LIMESTONE.

6-INCH DENISON BORING DURING CONSTRUCTION

DRILLING LOG		DIVISION	INSTALLATION		SHEET
PROJECT		S.W.D.	ALB. DIST.		1
LOCATION (Coordinates or Station)		Cuchillo Dam	N.G.V.D.		1
DRILLING AGENCY		XX	MANUFACTURER'S DESIGNATION OF DRILL		
HOLE NO. (As shown on drawing title and file number)		C-37-1	TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		0
NAME OF DRILLER		Williams	TOTAL NUMBER CORE BOXES		0
DIRECTION OF HOLE		<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	ELEVATION GROUND WATER		
THICKNESS OF OVERBURDEN		0.4	DATE HOLE		15 Dec. 90
DEPTH DRILLED INTO ROCK		11.6	ELEVATION TOP OF HOLE		16 Dec. 90
TOTAL DEPTH OF HOLE		12	TOTAL CORE RECOVERY FOR BORING		0%
			SIGNATURE OF INSPECTOR		Robert McVey

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	BLOW COUNTS	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	0 to 0.4		Gravel - Fill - Excavated material.			* Drilling 0 to 1.2' - 6" auger, set 8" metal casing + circulation pad, 4.2 to 8.8' - 7/8" rockbit,
	0.4 to 1.8		SHALE - red + green L.S. seams.			* Drilling 0 to 1.8' - 10" auger, set 8" metal casing + circulation pad, 1.8' to 6.8' - 7/8" rockbit,
	1.8' to 6.8		LIMESTONE - hard/very hard	1		heavy water loss @ 4.5'
	6.8' to 12		SHALE - red hard L.S. seams @; 7.6' to 8.2', 11.7' to 12.	2		6.8' to 8' - 6" Denison refusal on L.S. seam, 8' to 9' - 6" core gravel recovery, blind circulation @ 9', 9 to 11' - 6" Denison zero recovery, 11' to 12' - 6" Denison refusal - recovery suspect because cuttings noted near bottom of sample.
						xx To be surveyed
						Denison
						1 - 6.8' - 8' (lost 1')
						2 - 11' to 12

2-INCH AIR PERCUSSION BORINGS DURING CONSTRUCTION

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT <i>Cuchillo Negro Dam, NIM</i>		<i>Southwest</i>	<i>Albuquerque District</i>	OF 1 SHEETS		
2. LOCATION (Coordinates or Station) <i>STA 3+25.4, 4th right of 4 of HLOW</i>		10. SIZE AND TYPE OF BIT: <i>2" star - percussion</i>				
3. DRILLING AGENCY <i>McGraw Drilling and Blasting</i>		11. DATUM FOR ELEVATION SHOWN (TBM or BBL)				
4. HOLE NO. (As shown on drawing title and file number) <i>PH-3</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Gardner Denver Air Track</i>				
5. NAME OF DRILLER <i>Kevin Joe</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED <i>0</i> UNDISTURBED <i>0</i>				
6. DIRECTION OF HOLE <input type="checkbox"/> VERTICAL <input checked="" type="checkbox"/> INCLINED <i>25°</i> DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES <i>0</i>				
7. THICKNESS OF OVERBURDEN <i>0'</i>		15. ELEVATION GROUND WATER <i>NE</i>				
8. DEPTH DRILLED INTO ROCK <i>32'</i>		16. DATE HOLE STARTED <i>0940</i> COMPLETED <i>1137</i> <i>5/11/90</i> <i>5/11/90</i>				
9. TOTAL DEPTH OF HOLE <i>32'</i>		17. ELEVATION TOP OF HOLE				
		18. TOTAL CORE RECOVERY FOR BORING <i>3</i>				
		19. SIGNATURE OF INSPECTOR <i>[Signature]</i>				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			LIMESTONE: gray, hard micritic to argillaceous			
	5'		SHALE: brown, fissile, fossiliferous SILTSTONE: soft, iron stains			
	10'		SHALE or SILTSTONE: soft, light greenish gray to gray, scattered limestone nodules, non to slightly calcareous			
	15'		LIMESTONE: dark gray, argillaceous zones, mod soft to soft			
	20'		scattered thin shale beds, soft mod. hard to hard			18' - stopped drilling at 0954. There are too many leaks in the air line.
	25'		SHALE / CLAYSTONE, soft brown calcareous			1012: resume drilling after moving compressor closer to rig.
	30'		limestone nodules or thin beds			1055: stopped drilling no air return. ✓d hose
	35'		LIMESTONE: mod. hard, gray, fine to med. grained mod soft, argillaceous			1125 - resumed drilling 1137 - stopped drilling
	40'		CLAY			- could not advance or retrieve steel. No cuttings return. Had to abandon steel in the hole.
	45'		BOH			

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT		Southwest	Albuquerque District	1 OF 2 SHEETS		
2. LOCATION (Coordinate section)		Cuchillo Negro Dam, NM	10. SIZE AND TYPE OF BIT 2" star - percussion			
3. DRILLING AGENCY		STA 2+754 4 OF HLOW	11. DATUM FOR ELEVATION SHOWN (750 & 100)			
4. HOLE NO. (As shown on drawing title and file number)		McLure Drilling & Blasting	12. MANUFACTURER'S DESIGNATION OF DRILL	Gardner Denver Air Track		
5. NAME OF DRILLER		PH-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED	UNDISTURBED	
6. DIRECTION OF HOLE		Kevin Joe	14. TOTAL NUMBER CORE BOXES	N/A		
<input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.			15. ELEVATION GROUND WATER	N/A		
7. THICKNESS OF OVERBURDEN		0'	16. DATE HOLE	STARTED 5/11/90	COMPLETED 5/11/90	
8. DEPTH DRILLED INTO ROCK		60'	17. ELEVATION TOP OF HOLE			
9. TOTAL DEPTH OF HOLE		60'	18. TOTAL CORE RECOVERY FOR BORING	%		
			19. SIGNATURE OF INSPECTOR	[Signature]		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
			LIMESTONE: gray, micritic, mod. hard to hard.			
	5'		SHALE: brown, fissile, fossiliferous			
			SILTSTONE: light gray, soft, non calcareous, minor FeO staining, some FeO staining			
	10'		LIMESTONE: gray, mod. hard, micritic			
			SHALE: soft, tan			
	15'		LIMESTONE: argillaceous to micritic, mod. soft to mod. hard			
			mod. hard, some shale fragments			
	20'		scattered thin shale or claystone beds.			
			SHALE: soft, light gray to tan			
	25'		LIMESTONE:			
			SHALE/CLAYSTONE: soft, brown to reddish brown some gray and limestone fragments.			
	30'		scattered limestone beds or nodules.			
			LIMESTONE: gray, mod. hard			
	35'		SHALE: calcareous, light gray, scattered limestone nodules or beds.			
			LIMESTONE: gray, mod. hard, fine grained			
	40'		SHALE/CLAYSTONE: reddish brown, soft to very soft, abundant FeO staining			
	45'					

Hole No. PH-2

DRILLING LOG		DIVISION		INSTALLATION		SHEET 2 OF 2 SHEETS	
1. PROJECT Cuchillo Negro Dam, New Mexico		Southwest		Albuquerque District			
2. LOCATION (Coordinates or Station) STA 2+75.4 4 OF HLOW				10. SIZE AND TYPE OF BIT 2" inch star		Perforation	
3. DRILLING AGENCY McCaw Drilling & Blasting				11. DATUM FOR ELEVATION SHOWN (TBM or MSL)			
4. HOLE NO. (As shown on drawing title and file number) PH-2				12. MANUFACTURER'S DESIGNATION OF DRILL Gardner Denver Hit Tract			
5. NAME OF DRILLER Kevin Joe				13. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN		DISTURBED N/A	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				14. TOTAL NUMBER CORE BOXES N/A		UNDISTURBED N/A	
7. THICKNESS OF OVERBURDEN 0'				15. ELEVATION GROUND WATER N/A			
8. DEPTH DRILLED INTO ROCK 60'				16. DATE HOLE STARTED 1/328 5/11/90		COMPLETED 4/2 5/11/90	
9. TOTAL DEPTH OF HOLE 60'				17. ELEVATION TOP OF HOLE N/A			
				18. TOTAL CORE RECOVERY FOR BORING %			
				19. SIGNATURE OF INSPECTOR <i>Michael E. Smith</i>			
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
50			CLAY with abundant layers and or nodules or blocks of mod. hard to hard gray limestone some chips show polishing				
55			LIMESTONE: micritic to argillaceous, mottled gray and pinkish gray, mod. hard to hard				
60			BOH				
65							

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(TRANSMITTENT)

PROJECT

Cuchillo Negro Dam

HOLE NO.

PH-2

DRILLING LOG		DIVISION Southwest		INSTALLATION Albuquerque District		SHEET 1 OF 1 SHEETS	
1. PROJECT Cuchillo Negro Dam, NM				10. SIZE AND TYPE OF BIT 2" Star - recession			
2. LOCATION (Coordinates or Station) 9' right of Q, d.s. face of dam HLOW				11. DAYTIME FOR ELEVATION SHOWN (TBM - MSL)			
3. DRILLING AGENCY McCaw Drilling & Blasting				12. MANUFACTURER'S DESIGNATION OF DRILL Gardner Denver Air Track			
4. HOLE NO. (As shown on drawing title and file number) PH-1				13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN		DISTURBED UNDISTURBED	
5. NAME OF DRILLER Kevin Joe				14. TOTAL NUMBER CORE BOXES		0	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.				15. ELEVATION GROUND WATER NA		16. DATE HOLE STARTED 1225 5/11/90 COMPLETED 1248 5/11/90	
7. THICKNESS OF OVERBURDEN 0'				17. ELEVATION TOP OF HOLE			
8. DEPTH DRILLED INTO ROCK 45'				18. TOTAL CORE RECOVERY FOR BORING			
9. TOTAL DEPTH OF HOLE 45'				19. SIGNATURE OF INSPECTOR			
ELEVATION ft	DEPTH ft	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVER- ERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
			LIMESTONE: gray, micritic, moderately hard, fractured				
5			SHALE: brown, fissile, fossiliferous				
			SILTSTONE: light greenish gray, noncalcareous, soft to mod. soft				
10			LIMESTONE: Gray, mod. hard to hard				
15			SHALE: soft				
			LIMESTONE: argillaceous, mod. soft				
20			mod. hard w/ scattered thin shale beds				
			hard				
25			SHALE: soft				
			LIMESTONE: as above				
			SHALE/CLAYSTONE: scattered thin mod. hard limestone beds, soft to mod. soft, scattered clay lenses, reddish brown with patches of gray				"burst" gray dust indicate nodules.
30			LIMESTONE: argillaceous, gray, mod. hard				
			CLAYSTONE/SHALE: brown, soft				
35			LIMESTONE: gray, mod. hard				
			SHALE: calcareous, nodular or with thin limestone beds				
40			LIMESTONE: gray, mod. hard fine to medium grained.				
45			CLAY: reddish brown, soft shaded BOH				

Hole No. PH-0

DRILLING LOG		DIVISION	INSTALLATION	SHEET		
1. PROJECT <i>Cuchillo Negro Dam, NM</i>		<i>Southwest</i>	<i>Albuquerque District</i>	<i>OF 1 SHEETS</i>		
2. LOCATION (Coordinates or Station) <i>STA 1+854, 100' right of & ALLOW</i>		10. SIZE AND TYPE OF BIT <i>2" star - percussion</i>				
3. DRILLING AGENCY <i>McGraw Hill & Blasting</i>		11. DAYUM FOR ELEVATION SHOWN (TBM or BBL)				
4. HOLE NO. (As shown on drawing title and file number) <i>PH-0</i>		12. MANUFACTURER'S DESIGNATION OF DRILL <i>Gardner Denver Air Track</i>				
5. NAME OF DRILLER <i>Kevin Joe</i>		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED <input checked="" type="checkbox"/> UNDISTURBED <input checked="" type="checkbox"/>				
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		14. TOTAL NUMBER CORE BOXES _____				
7. THICKNESS OF OVERBURDEN <i>0'</i>		15. ELEVATION GROUND WATER _____				
8. DEPTH DRILLED INTO ROCK <i>48'</i>		16. DATE HOLE STARTED <i>1300</i> COMPLETED <i>15</i> <i>5/11/90</i> <i>5/11/90</i>				
9. TOTAL DEPTH OF HOLE <i>48'</i>		17. ELEVATION TOP OF HOLE _____				
		18. TOTAL CORE RECOVERY FOR BORING _____ %				
		19. SIGNATURE OF INSPECTOR <i>Chas. B. Smith</i>				
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			LIMESTONE: gray, medium, hard			
	5		SHALE, fissile, brown, abundant fossils, calcareous			
	10		SILTSTONE: light greenish gray, soft, non calcareous, FeO stains.			
	15		LIMESTONE: gray, mod. hard to hard, fine grained			
	20		SHALE: light tan to gray, soft			
	25		LIMESTONE: argillaceous, mod. soft, light gray to tan			
	30		mod. hard			
	35		hard			
	40		scattered shale beds			
	45		SHALE, brown, soft			
			LIMESTONE: argillaceous, as above			
			SHALE: tan, calcareous, with limestone nodules			
			LIMESTONE: fine grained, gray, mod. hard			
			SHALE: as at 27.5' except no nodules			
			LIMESTONE: gray, mod. hard, fine grained			
			SHALE, soft to mod. soft, tan			
			CLAY: reddish brown, soft, some polishing, scattered limestone			
			BDH			

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PROJECT *Cuchillo Negro Dam* HOLE NO. *PH-0*

CONTRACTOR'S WATER WELL DRILLERS LOG

STATE ENGINEER OFFICE
WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well PCL Constructors, Inc.
Street or Post Office Address 300 W. 4th Street, Suite 117
City and State Truth or Consequences, NM 87901

Filed with
Jim Smith
SEO
5-11-90

Well was drilled under Permit No. RG-51778-X and is located in the:

a. NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 35 Township 12 S. Range 5 W. N.M.P.M.
b. Tract No. _____ of Map No. _____ of the _____
c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.
d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in
the _____ Grant.

(B) Drilling Contractor Johnson Drlg. Co. License No. _____

Address T or C. NM

Drilling Began 3/24/90 Completed 3/26/90 Type tools air rotary Size of hole 6 5/8 in

Elevation of land surface or _____ at well is 4635 ft. Total depth of well 340 ft.

Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well abandoned ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
			None	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
None								

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

Section 5. PLUGGING RECORD

Plugging Contractor Johnson Drlg. Co. & PCL Constructors

Address _____

Plugging Method _____

Date Well Plugged 3/28/90

Plugging approved by: _____

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1	100	110	12
2	Surface	20	16
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received _____

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

[illegible]

1. *Staphylococcus aureus* (100%)

Agent

B-214

PCL Civil Constructors, Inc.
 Ouchillo Negro Project
 Sample Well Log
 March 24, 1990
 Samples by Tim Kelly, Geohydrology Associates, Inc.
 (Plugged and abandoned 3/28/90)

6 5/8-inch pipe at 40 feet (Recovered)

Top	Thickness	Description
		<u>Alluvium</u>
Surface	11	Gravel, fine to coarse, variegated, rounded to sub-subrounded, sandy
11	17	Clay, light red, silty to sandy, some sand and gravel stringers
		<u>Santa Fe Formation</u>
28	17	Sand, light red, fine to very fine, silty to clayey; scattered pebbles
45	7	Gravel, fine to medium, angular, predominately limestone fragments; may be stringers of lithified pink sand
52	3	Conglomerate, pink, contouring angular fragments of limestone, poorly consolidated
55	4	Gravel, fine to medium, as above. Making 3-4 gal/min water
59	1	Sandstone, pink, poorly consolidated, very fine to fine grained, silty. Swivel broke; shut down.
60	12	Sandstone, pink, fine to coarse, gravelly with some clay stringers. Abundant limestone angular fragments
72	10	Clay, reddish pink, silty to clayey with interbedded sand and gravel
82	13	Siltstone, grayish buff, clayey to sandy; abundant limestone and red shale fragments. Hard drilling.
95	27	Sandstone, grayish buff, fine to medium grained, gravelly; predominately gray limestone fragments. Hard drilling. Some light gray clay laminae 115 to 120 feet.
122	10	Sandstone, reddish pink, clayey; abundant limestone fragments

132	9	Clay, buff, to yellow, silty
141	4	Clay, gray to dark gray, silty
		<u>Macdalena Formation</u>
145	6	Shale, gray to dark gray, red staining of fractures
151	19	Siltstone, greenish gray, sandy, very hard; some interbedded purple shale from 165 to 170 feet
170	15	Sandstone, greenish gray, fine to very fine grained, well consolidated
185	4	Shale, dark purple, hard; some red staining
189	16	Shale, black, soft
205	10	Sandstone, greenish gray, very fine to fine grained, well consolidated
215	45	Shale, black, soft; alternating with sandstone above
260	15	Sandstone, greenish gray, fine grained, very hard
275	15	Shale, black, soft to moderate hard
290	50	Sandstone, greenish gray, fine to very fine grained, abundant black fragments, very hard; slow drilling. Coal fragments at 320 ft. Thin, black laminae in sandstone fragments
340		TOTAL DEPTH

APPENDIX C

APPENDIX C
TABLE OF CONTENTS

	Description	Page No.
Table C-1	Lithologic Description of Rock Units Exposed in the Foundation Trench and the Left Abutment of the Auxiliary Spillway	C-2
Table C-2	Lithologic Description of the Palomas Gravel Exposed in the Auxiliary Spil- lway Excavation	C-9
Figure C-1	Stereonet of Joints Exposed on the Left Side of the Auxiliary Spillway	C-11
Figure C-2	Stereonet of Joints Exposed on the Right Abutment of the RCC Dam	C-12
Figure C-3	Stereonet of Joints Exposed on the Left Abutment of the RCC Dam	C-13
Figure C-4	Joint Rosette of Joints Exposed on the Left Side of the Auxiliary Spillway	C-14
Figure C-5	Joint Rosette of Joints Exposed on the Right Abutment of the RCC Dam	C-15
Figure C-6	Joint Rosette of Joints Exposed on the Left Abutment of the RCC Dam.....	C-16

Table C-1 Lithologic Description of Rock Units Exposed in the Foundation Trench and the Left Abutment of the Auxiliary Spillway

Unit No.	Description
1	<u>LIMESTONE</u> (micrite); mottled medium gray (N5) and pale red purple (5RP6/2); moderately hard to hard; very fine grained; main body of rock is unweathered to slightly weathered, severe weathering extends from joints from 1 inch to over 1 foot; thin to medium bedded, individual beds separated by thin shaley seams with abundant invertebrate fossils; moderately close to wide jointed, joints vary from tight to open to 1 foot and are generally slightly rough, joint surfaces are coated with calcite, iron oxide (FeO) stains, and minor manganese oxide (MnO) stains, most open joints are filled with moderate reddish brown clay, some open joints have no filling; scattered fossils, often concentrated into zones; the pale red purple is more predominant near the shale beds. (FC)
1a	<u>LIMESTONE</u> ; like Unit No.1, except weathered; medium to thick bedded; joints are open to 10+ feet. (FC)
1b	<u>LIMESTONE</u> ; like Unit No. 1, except medium to thick bedded; abundant CaCO ₃ (calcite) veins. (FC)
2	<u>LIMESTONE</u> ; light olive gray (5Y6/1); moderately soft; very fine grained, slightly argillaceous; primarily unweathered; thin bedded with faint shale parting; moderately close jointed, joints are tight to open to 1 inch, but usually less than ½ inch, rough, and coated with calcite, FeO, and minor MnO, open joints filled with clay; small invertebrate fossils and fossil fragments scattered throughout. (FC)
3	<u>LIMESTONE</u> (micrite); medium gray (N5); moderately hard; very fine grained; primarily unweathered; thin bedded; moderately close jointed, joints are tight to open to 1 inch, but usually less than ½ inch, rough, and surfaces coated with calcite, FeO, and minor MnO, open joints filled with clay. (FC)
4	<u>ARGILLACEOUS LIMESTONE</u> ; mottled light olive gray (5Y6/1) and medium dark gray (N4); soft to moderately hard, very fine to fine grained; slightly weathered; thin bedded; composed of moderately hard, rounded, somewhat irregular limestone nodules in a matrix of calcareous shale; moderately close jointed, joints are tight; contains abundant brachiopod fossils. (FC)
5	<u>SILTSTONE</u> ; very light gray (N8) to yellowish gray (5Y8/1); moderately soft; fine grained, slightly weathered; very thin bedded; close jointed, joints are tight, and surfaces are coated with calcite, and FeO; calcareous; slakes readily when exposed to air. (FC)

Table C-1 cont'd

6	<u>LIMESTONE</u> (oolitic); mottled brownish gray (5YR4/1) and grayish red (10R4/2); moderately soft; fine to medium grained; slightly to moderately weathered; thin bedded; close jointed, joints are tight and rough; composed of approximately 30% - 40% slightly irregular rounded ooids to 1/4 inch-diameter in a matrix of argillaceous limestone with a faint fissile structure; scattered bryozoan fossils. (FC)
7	<u>SILTSTONE</u> ; very pale orange (10YR8/2); moderately soft, very fine to fine grained; moderately to highly weathered; thin bedded; close jointed, joints are tight to open to 1/4 inch, slightly rough to smooth, and coated with minor calcite, MnO, and FeO stains and some clay; minor Liesegang FeO banding in body of rock; highly calcareous; small bryozoan fossils scattered throughout. (FC)
8	<u>LIMESTONE/SHALE</u> ; mottled medium dark gray (N4), yellowish gray (5Y8/1), light brownish gray (5YR6/1), and grayish black (N2); moderately soft to moderately hard; very fine grained; moderately weathered; thin bedded; close jointed, joints are tight to open to 1/4 inch, rough to slightly rough, and coated primarily with calcite, clay, and minor FeO stains; composed of moderately hard irregular limestone nodules to 2 inches in a matrix of black to dark gray shale; slakes upon continued exposure to air. (FC)
9	<u>SHALE</u> ; light brownish gray (5YR6/1) to brownish gray (5YR4/1); moderately soft; very fine grained; slightly weathered; laminated (fissile); close jointed, joints are tight and generally filled or coated with calcite; highly calcareous; contains abundant pelecypod fossils as casts and molds with carbonaceous coatings; slakes when exposed to air. (FC)
10	<u>SHALEY SILTSTONE</u> (sheared); light brownish gray (5YR6/1) with abundant reddish brown FeO stains in body of rock; moderately soft; very fine to fine grained; slightly to moderately weathered; very thin bedded, bedding very irregular; close jointed, joints are tight, smooth to slightly rough, and coated primarily with calcite and FeO stains with abundant slickensides; abundant slickensides and polishing throughout body of rock; calcareous; slakes readily when exposed to air. (FC)
11	<u>LIMESTONE</u> ; light gray (N7) to medium light gray (N6); hard; very fine to fine grained; unweathered to slightly weathered except near joints where it becomes completely weathered; medium to thick bedded; moderately close jointed, joints are slightly rough and generally open to 3 inches, although some are open to 9 inches, open joints are filled with clay from completely weathered limestone, joint surfaces coated with calcite, FeO, minor MnO, and clay; abundant fossil fragments < 1/4 inch scattered throughout. (FC)
12	<u>LIMESTONE</u> (argillaceous); mottled light olive gray (5Y6/1) and medium dark gray (N4); moderately hard; very fine grained; unweathered to slightly weathered except near joints where it is highly weathered; medium to thick bedded; moderately close jointed, joints are open to 4 to 5 inches, slightly rough, and filled with FeO stained clay; scattered fossil fragments throughout. (FC)

Table C-1 cont'd

13	<u>LIMESTONE</u> (micrite); medium gray (N7) to light brownish gray (5YR6/1); moderately hard to hard; very fine grained; unweathered to slightly weathered except near joints where it is completely weathered; medium bedded; moderately close jointed, joints are open to generally less than 1 to 2 inches, slightly rough to rough, and filled with clay; thin randomly oriented calcite veins scattered throughout; slightly argillaceous. (FC)
14	<u>SHALE</u> ; mottled very light gray (N8), light gray (N7), and pinkish gray (5YR8/1); soft to moderately soft; very fine to medium grained; highly weathered; laminated (fissile); very close jointed, joints are tight, rough, and coated with calcite, FeO stains, and minor MnO dendrites; calcareous; slakes when exposed to air. (FC)
15	<u>LIMESTONE</u> (micrite); light brownish gray (5YR6/1); hard; very fine grained; unweathered except near joints where severe weathering and alteration extend up to 2 feet from joints; medium bedded; moderately close jointed, joints are generally open to 2 to 3 feet or more, slightly rough to rough, filled with clay, and coated with SiO ₂ (quartz), calcite, and MnO and FeO stains; fossils and fossil fragments scattered throughout. (FC)
16	<u>LIMESTONE</u> (bioclastic); mottled light brownish gray (5YR6/1) and grayish red purple (5R4/2) to pale red (10R6/2) and medium gray (N5); moderately hard to hard; fine to coarse grained, composed of abundant fossil fragments in a fine grained matrix; unweathered to slightly weathered; moderately close to close jointed, joints are tight to open to ¼ inch, rough to slightly rough, and coated with calcite, FeO stains, and minor clay. (FC)
17	<u>SHALE</u> ; yellowish gray (5Y7/2) to light olive gray (5Y5/2); very soft to soft; fine grained; unweathered to slightly weathered; laminated to thin bedded (fissile); moderately close to wide jointed, joints are tight to open to ¼ inch, slightly rough to smooth, and coated with calcite and minor FeO and MnO stains; slightly calcareous; slakes when exposed to the air. (FC)
18	<u>SHALE</u> ; same as Unit No. 17 except soft and less fissile (FC)
19	<u>SILTSTONE</u> ; mottled very light gray (N8) and dusky red (5R3/4); soft; fine grained; slightly weathered; thin bedded; close jointed, joints are tight, smooth to slightly rough, and coated with minor FeO; abundant hematite stains throughout as halos on old fractures and possible fossil fragments or organic blebs; noncalcareous; slakes readily upon exposure to the air. (FC)
20	<u>LIMESTONE/SHALE</u> ; mottled light brownish gray (5YR6/1), medium light gray (N6), and yellowish gray (5Y8/1); fine grained; composed of irregular limestone nodules and fossils to 1 inch in a matrix of argillaceous limestone and calcareous shale; slightly weathered; thin bedded; highly jointed, joints are tight to open to ¼ inch, moderately rough, and coated with minor FeO stains, clay, and a trace of MnO stains; shale has abundant fossil casts and molds. (FC)

Table C-1 cont'd

21	<u>LIMESTONE</u> (argillaceous); pale red (5R6/2) mottled with minor medium gray (N5); moderately soft to moderately hard; fine grained; slightly weathered; medium bedded; faint laminations; moderately close to wide jointed, joints are open to 2 inches, moderately rough, filled with clay, and coated with calcite and minor FeO and MnO stains; scattered fossil fragments. (FC)
21a	<u>LIMESTONE</u> ; like Unit No. 21 except less argillaceous. (FC)
22	<u>LIMESTONE</u> (argillaceous); dark yellowish brown (10YR4/2) where fresh, to yellowish gray (5Y8/1) near weathered joints; moderately hard to hard; very fine to fine grained, slightly silty with faint laminations; primarily unweathered but bleached and altered near joints; thin to medium bedded, most beds > 1 foot; moderately close to wide jointed, joints are open to 1/4 inch with some to 2 inches, slightly rough, filled with clay and calcite veins, and coated with FeO and MnO stains, fossils scattered throughout, abundant N-S and E-W calcite veins. (FC)
22a	<u>LIMESTONE</u> ; like Unit No. 22 except very few calcite veins. (FC)
23	<u>LIMESTONE</u> ; light gray (N7), moderately soft to moderately hard; fine grained, composed of nodules of limestone in a shale matrix; slightly weathered; thin bedded; close jointed, joints are open to 1/2 inch, slightly rough, and coated with calcite and minor FeO stains and clay; scattered fossils. (FC)
24	<u>LIMESTONE</u> (micrite); pale yellowish brown (10YR6/2); hard; very fine grained with abundant very hard chert nodules and lenses to 8 inches throughout; slightly weathered to unweathered except adjacent to joints, where it is completely weathered; massive; moderately close to wide jointed, joints are open to 3 feet, most open between 6 inches and 1.5 feet, filled with reddish brown clay and some collapse breccia from overlying rock units; scattered fossil fragments; base of larger solution cavities covered by 2-inch-thick layer of silicified mud. (FC)
25	<u>SHALE</u> ; mottled moderate reddish orange (10R6/6) and light brown (5YR6/4); moderately soft to soft; fine grained; slightly to moderately weathered with zones of complete weathering overlying solution cavities; very thin bedded to laminated; highly jointed, joints are rough, tight to open to < 1/4 inch, and coated with minor clay, FeO stains, and MnO dendrites; scattered fossils; noncalcareous; slakes when exposed to the air. (FC)
26	<u>LIMESTONE</u> (crystalline); pale yellowish brown (10YR6/2); hard; fine to medium grained; slightly weathered; thin bedded; close jointed, joints are tight, rough, and coated with clay, calcite, and minor FeO stains and MnO dendrites; fossils and fossil fragments scattered throughout. (FC)
27	<u>SHALE</u> ; pale brown (5YR5/2); moderately soft; fine grained; generally slightly weathered, but zones of complete weathering overlying solution cavities; very thin bedded to laminated; very close jointed, joints are smooth, tight to open to 1/16 inch, and coated with calcite, FeO stains, and minor MnO stains; noncalcareous; slakes when exposed to air. (FC)

Table C-1 cont'd

28	<u>CLAY/BRECCIA</u> ; white (N9) with zones of reddish brown to moderate red FeO staining; very soft to soft; very fine to coarse grained, composed of brecciated, highly to completely weathered limestone and shale in a high plasticity clay, degree of brecciation is extremely variable from abundant fragments to none; forms cavity infilling material as well as large zones of completely altered material overlying solution cavities; most FeO staining is in lower portion; highly jointed, joints are coated with FeO stains and abundant slickensides, slickensides show no preferred orientation; increased FeO staining in bottom coincides with a decrease in reaction with HCl. (FC)
29	<u>SILTSTONE</u> ; grayish orange pink (5YR7/2) with some FeO staining; soft; very fine grained to fine grained; moderately to slightly weathered; thin to medium bedded; close jointed, joints are tight to open to ¼ inch, slickensided, and coated with calcite, clay, and FeO stains; slickensides have no preferred orientation; limonite replaced framboidal structures scattered throughout; noncalcareous; slakes when exposed to air. (FC)
30	<u>LIMESTONE</u> (bioclastic); light brownish gray (5YR6/1); hard; fine to coarse grained, composed of 80% fossils and fossil fragments in an aphanitic groundmass; slightly weathered; thin to medium bedded; close jointed, joints are tight, rough, and coated with calcite, clay, and minor FeO stains. (FC)
31	<u>LIMESTONE/SHALE</u> ; mottled brownish gray (5YR6/1) and yellowish gray (5Y6/1); soft to moderately hard; fine grained shale interbedded with lenticular to irregular limestone nodules, ratio of limestone to shale varies from 2.5:1 to 1:2.5; moderately weathered; very thin to thin bedded; close jointed, joints are tight to open to less than ¼ inch, smooth to slickensided, and coated with calcite, minor clay, and minor FeO stains; calcareous; possibly an intraformational breccia caused by turbidity currents during deposition. (FC)
32	<u>LIMESTONE</u> (argillaceous); light gray (N7) to moderate light gray (N6); moderately soft to moderately hard; very fine grained to fine grained with scattered rounded medium grains; slightly weathered; thin bedded; moderately close jointed, joints are slightly rough, open to ¼ inch, coated with calcite and FeO stains, and filled with clay (FC)
33	<u>LIMESTONE</u> (micrite); mottled light gray (N7) and minor pale red (5R6/2); hard; very fine grained; unweathered to slightly weathered except where completely weathered adjacent to joints; thick bedded; medium wide to wide jointed, joints are open to 1 to 2 feet, but most are less than 1 foot, smooth, filled with clay and water-deposited clay, sand, and gravel, and coated with minor calcite. (FC)

Table C-1 cont'd

34	<u>SHALE</u> ; pale red (10R6/2) to pale yellowish brown (10YR6/2); soft; very fine grained; slightly weathered to unweathered; very thin bedded to laminated; close jointed, joints are smooth with some slickensides, tight to open to $< \frac{1}{4}$ inch, and coated with FeO and MnO stains and minor calcite; some leisigang FeO banding and stains adjacent to joints and, to lesser degree, in body of rock; calcareous; slakes when exposed to the air. (FC)
34a	<u>SHALE</u> ; like Unit No. 34 except moderately soft to moderately hard; slightly more calcareous; contains abundant pelecypod and some belemnite fossils as casts, molds, and carbonaceous imprints. (FC)
34b	<u>SHALE</u> ; like Unit No. 34 except moderately hard; highly calcareous; transitional between shale and bioclastic limestone. (FC)
35	<u>CLAYSTONE</u> ; yellowish gray (5Y8/1) to light olive gray (5Y6/1); soft; very fine grained; slightly weathered; very thin bedded; close jointed, joints are concoidal slickensided shear joints with FeO stains and minor calcite; some FeO stains and leisigang banding in body of rock; lower contact is sheared; noncalcareous; slakes readily when exposed to air. (FC)
36	<u>LIMESTONE</u> ; (micrite); top 2 feet medium light gray (N6), bottom 3 feet mottled medium light gray (N6) and moderate red (5R5/4); hard; very fine grained, bottom 1 foot grades into shale; slightly weathered; medium to thick bedded; moderately close jointed, joints are open to three to four inches, slightly rough, and filled with clay and brecciated altered limestone. (FC)
37	<u>SHALE</u> ; light gray (N7); soft to moderately soft; very fine grained; slightly weathered; very thin bedded; close jointed, joints are open to 1 to 2 inches, most $< \frac{1}{4}$ inch, smooth, coated with FeO stains and calcite and filled with clay; minor slickensides on some joints and in body of rock; calcareous; very few fossils; slakes when exposed to air. (FC)
38	<u>SHALE/CLAYSTONE</u> ; pale yellowish brown (10YR6/2); soft; very fine grained; slightly to moderately weathered; very thin bedded to laminated; close to very close jointed, joints are tight, smooth, coated with minor FeO stains and calcite, and slickensided; very few fossils; slightly calcareous to noncalcareous; slakes readily when exposed to air. (FC)
39	<u>SANDSTONE</u> ; medium dark gray (N4); moderately hard but soft where weathered; medium grained, composed of rounded quartz grains in a slightly to noncalcareous matrix; unweathered to completely weathered where brecciated; medium bedded; close jointed, joints are tight to open to 1 inch, slightly rough, coated with calcite and minor FeO stains, and filled with clay; occurs as broken, discontinuous bed and collapse breccia. (FC)

Table C-1 cont'd

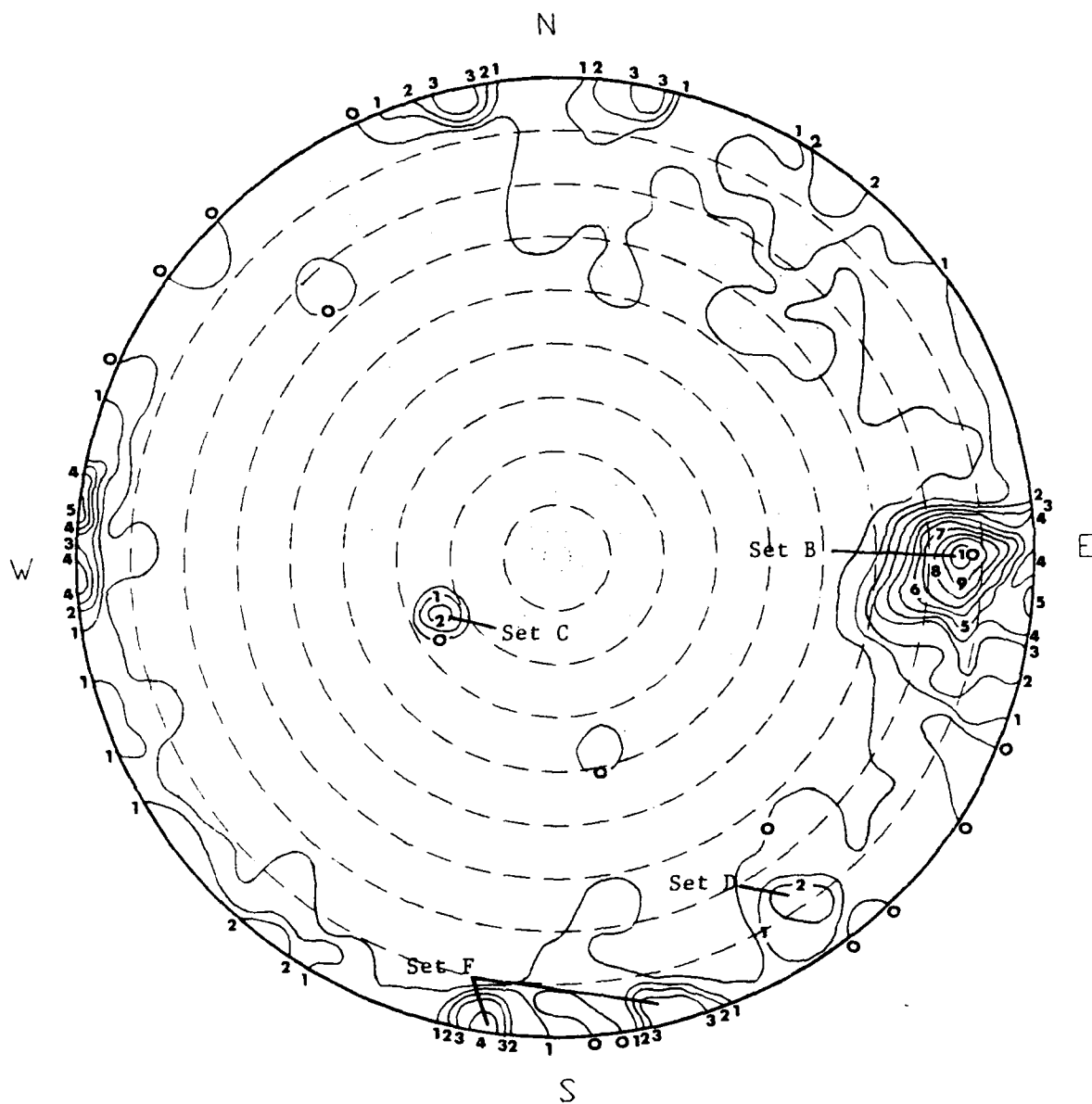
40	<u>SHEAR ZONE/BRECCIA</u> ; multicolored; primarily very soft to soft except for clast of harder rock; composed of angular to well rounded fragments of limestone, shale, and minor sandstone to 12 inches in a matrix of clay and altered shale; contains abundant slickensides and collapse structures; consists of cavity infilling, as well as in-place sheared material formed by movement along a bedding plane fault and collapse into underlying solution cavities. (FC)
41	<u>LIMESTONE</u> (micrite); medium light gray (N6); hard; very fine grained; unweathered; thin to medium bedded; moderately close jointed, most joints are healed with calcite, others are tight to open to <1/4 inch, slightly rough, and coated with FeO stains and clay; conchoidal fracturing abundant in rock; abundant thin, randomly oriented calcite veins throughout. (FC)
42	<u>LIMESTONE</u> ; mottled light brownish gray (5YR6/1) and light olive gray (5Y6/1); soft to hard; very fine grained, composed of 80% irregular limestone nodules in shale matrix; slightly weathered; thin bedded; close jointed; joints are tight to open to <1/4 inch, rough, and filled with calcite and FeO stained clay. (FC)
43	<u>LIMESTONE</u> ; like Unit No. 41, except mottled medium light gray (N6) and pale red (5R6/2). (FC)
44	<u>LIMESTONE/SHALE</u> ; medium dark gray (N4) except where bleached adjacent to joints; moderately hard to hard; shale is very fine grained, limestone is fine to medium grained, 70% limestone and 30% shale; unweathered to slightly weathered with bleaching halos adjacent to calcite healed joints and veins; thin to medium bedded; moderately close to wide jointed, majority of joints are filled and healed with coarsely crystalline calcite; limestone has abundant fossils and fossil fragments. (FC)
45	<u>SILTSTONE</u> ; light olive gray (5Y6/1); moderately soft; very fine grained; slightly weathered; thin to very thin bedded; very close to close jointed, joints are tight to open to 1/4 inch, slickensided, and coated with calcite, minor FeO stains, and smeared chlorite; abundant slickensided surfaces throughout; noncalcareous; slakes with continued exposure to air. (FC)
46	<u>LIMESTONE/SILTSTONE</u> ; Interbedded Units No. 42 and No. 45. (FC)
47	<u>INTRAFORMATIONAL BRECCIA</u> ; Angular clast to 4 inches of Unit No. 41 limestone in Unit No. 45 siltstone. (FC)
48	<u>LIMESTONE/SHALE</u> ; Interbedded Units No. 18 and No. 21. (FC)
49	<u>CLAY</u> ; white (N9), very soft, very fine grained, completely weathered limestone. (FC)
50	<u>SHALE/LIMESTONE</u> ; Interbedded Units No. 25 and No. 26. (FC)

Table C-2 Lithologic Description of Units of the Palomas Gravel Exposed in the Auxiliary Spillway Excavation

Unit No.	Description
1	<u>CONGOMERATE</u> ; moderate brown (5YR4/4); about 35% to 45% fine to coarse sand (mostly fine), 15% to 25% silt and low plastic clay, 30% to 50% subangular, blocky, moderately hard limestone gravel to 6 inches (most less than 3 inches); very firm to dense; moderate to high cementation, homogeneous, calcareous, indurated Mud Mountain Fanglomerate member. (FC)
2	<u>SANDSTONE</u> ; pale red (10R6/2); moderately soft; fine to medium grained; composed of subrounded to subangular lithic and quartz grains; unweathered to slightly weathered; thin bedded; no joints; contains scattered subrounded primarily igneous clast to 1 inch; calcareous; moderately indurated. (FC)
3	<u>CONGLOMERATE</u> ; multicolored but appears primarily pale red (10R6/2); moderately soft to hard; fine to very coarse grained; composed primarily of subrounded, moderately soft to hard igneous clast to 6 inches (most less than 3 inches) with scattered cobbles and boulders in a fine to coarse grained (mostly medium) matrix; unweathered to slightly weathered; thin to medium bedded; joints not distinguishable; contains abundant massive to coarsely crystalline calcite in the matrix; calcareous; moderately to well indurated. (FC)
4	<u>SILTY SAND</u> (SM); moderate brown (5YR4/4); about 60% to 70% fine to coarse (mostly fine to medium), subangular to subrounded quartz and lithic grains, 20% to 30% silt and low plastic clay, 5% to 15% subangular to subrounded, moderately soft to hard igneous gravel to 3 inches; dense; weak to moderate cementation; homogeneous; slightly calcareous; scattered slickensides. (FC)
4a	<u>SILTY SAND</u> (SM); like Unit No. 4 except 25% to 30% gravel. (FC)
5	<u>CLAYEY SAND WITH GRAVEL</u> (SC); mottled moderate brown (5YR4/4) and grayish orange pink (10R8/2); about 65% to 75% fine to coarse, subangular to subrounded (mostly medium and subangular) sand, 10% to 20% low plastic fines, and 10% to 20% subangular, moderately soft limestone gravel to ¼ inch; very firm; weak cementation; homogeneous; calcareous. (FC)
6	<u>POORLY GRADED GRAVEL WITH CLAY AND SAND</u> (GW-GM); moderate brown (5YR4/4); about 55% to 65% subangular to subrounded primarily igneous gravel to ½ inch with scattered gravel to 3 inches, 25% to 35% fine to coarse, subangular to subrounded sand, 5% to 15% plastic fines; loose to firm; weak cementation; homogeneous; slightly calcareous; FeO stains throughout. (FC)
7	<u>WELL GRADED GRAVEL WITH SILT AND SAND</u> (GW-GM); moderate brown (5YR4/4); about 45% to 55% subrounded to rounded, moderately hard to hard igneous gravel to 3 inches with scattered cobbles, 35% to 45% fine to coarse, subrounded sand, and 5% to 15% silt and low plastic fines; loose to firm; weakly cemented to noncemented; small lenses of clay and/or sand throughout; slightly calcareous. (FC)

Table C-2 cont'd

Unit No.	Description
8	<u>CONGLOMERATE</u> ; multicolored but appears primarily pale red (10R6/2); moderately soft to hard; fine to very coarse grained; composed primarily of subrounded to rounded, moderately soft to hard igneous and minor limestone gravel to 1 inch (mostly less than 1/2 inch) in a matrix of fine to coarse sand; unweathered to slightly weathered; thin bedded; no discernable joints; calcareous; moderately to well indurated. (FC)
9	<u>SILTY SAND WITH GRAVEL</u> (SM); moderate brown (5YR4/4); about 55% to 65% fine to coarse (mostly fine to medium) subangular to subrounded quartz and lithic grains, 15% to 25% silt and low plastic clay; 15% to 25% subangular to subrounded, moderately soft to hard igneous gravel to 1 inch with scattered gravel to 2 inches; dense; moderate cementation; slightly calcareous. (FC)
10	<u>SILTY SAND</u> (SM); moderate brown (5YR4/4); about 65% to 75% fine to coarse (mostly fine to medium) subangular to subrounded quartz and lithic grains, 25% to 35% silt, scattered subrounded to rounded igneous gravel to 1 inch; looses to firm; weak cementation; homogeneous; slightly calcareous. (FC)
11	<u>POORLY GRADED GRAVEL WITH SAND</u> (GP); multicolored; about 60% to 70% subrounded, moderately soft to hard igneous gravel to 2 inches with scattered gravel to 3 inches, 30% to 40% fine to coarse (mostly medium) subrounded to subangular sand; trace of fines; loose to firm; noncemented; thin bedded; calcareous. (FC)
12	<u>WELL GRADED SAND WITH GRAVEL</u> (SW); moderate brown (5YR4/4); about 70% to 80% subrounded to subangular, fine to coarse sand composed primarily of lithic with some quartz grains, 20% to 30% subrounded, soft to hard igneous gravel to 2 inches with scattered gravel to 3 inches, trace of fines; loose to firm; weak cementation; thin bedded; calcareous. (FC)
13	<u>POORLY GRADED GRAVEL WITH CLAY AND SAND</u> (GP-GC); moderate brown (5YR4/4); about 50% to 60% subrounded, primarily igneous gravel to 1 1/2 inches, 30% to 40% fine to coarse, subangular to subrounded sand, 5% to 15% plastic fines; firm; weak cementation; thin bedded; slightly calcareous; FeO stains throughout. (FC)



Note: Contours represent percent of 235 mapped joints.

Figure C-1 Stereonet of Joints Exposed on the Left Side of the Auxiliary Spillway

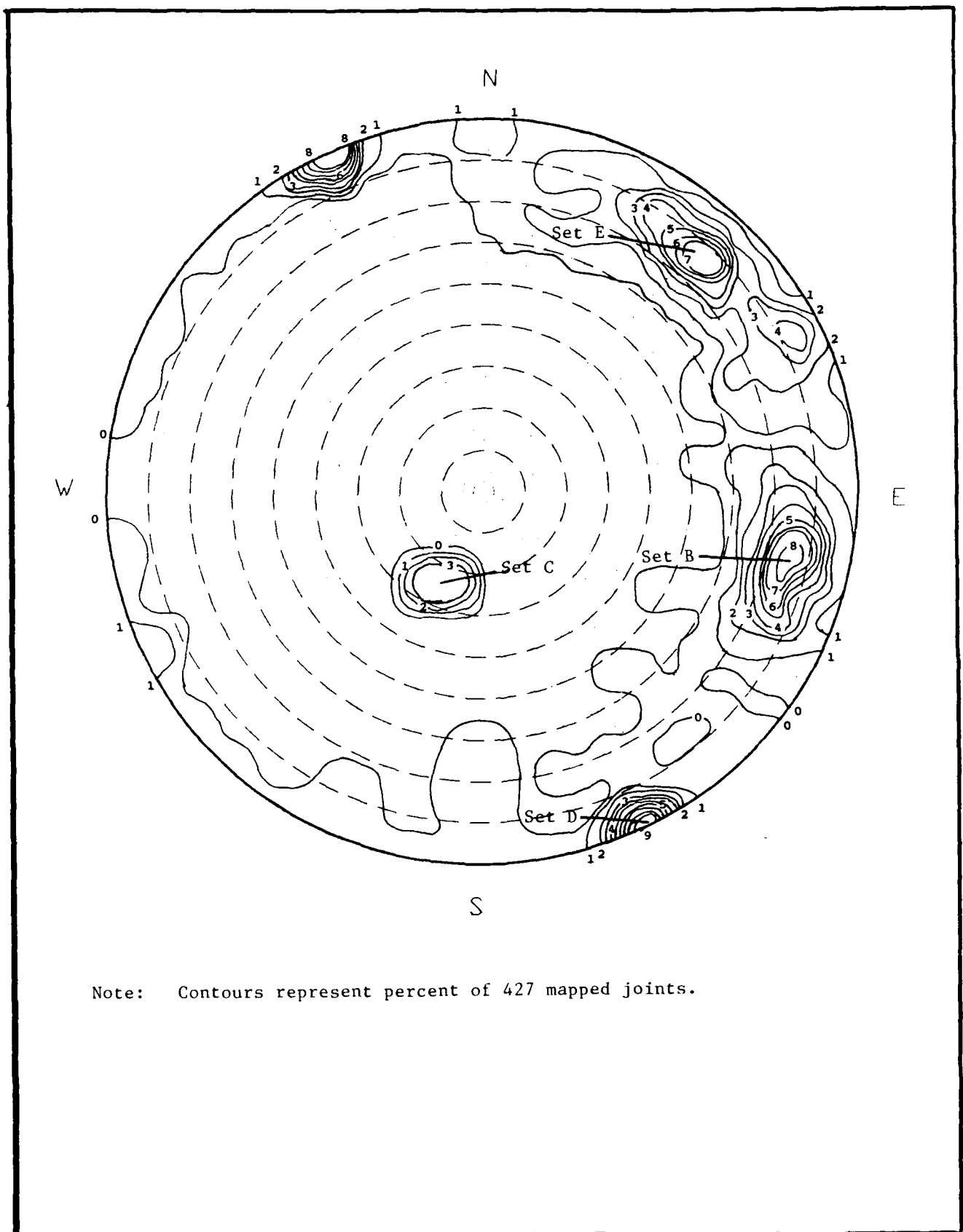
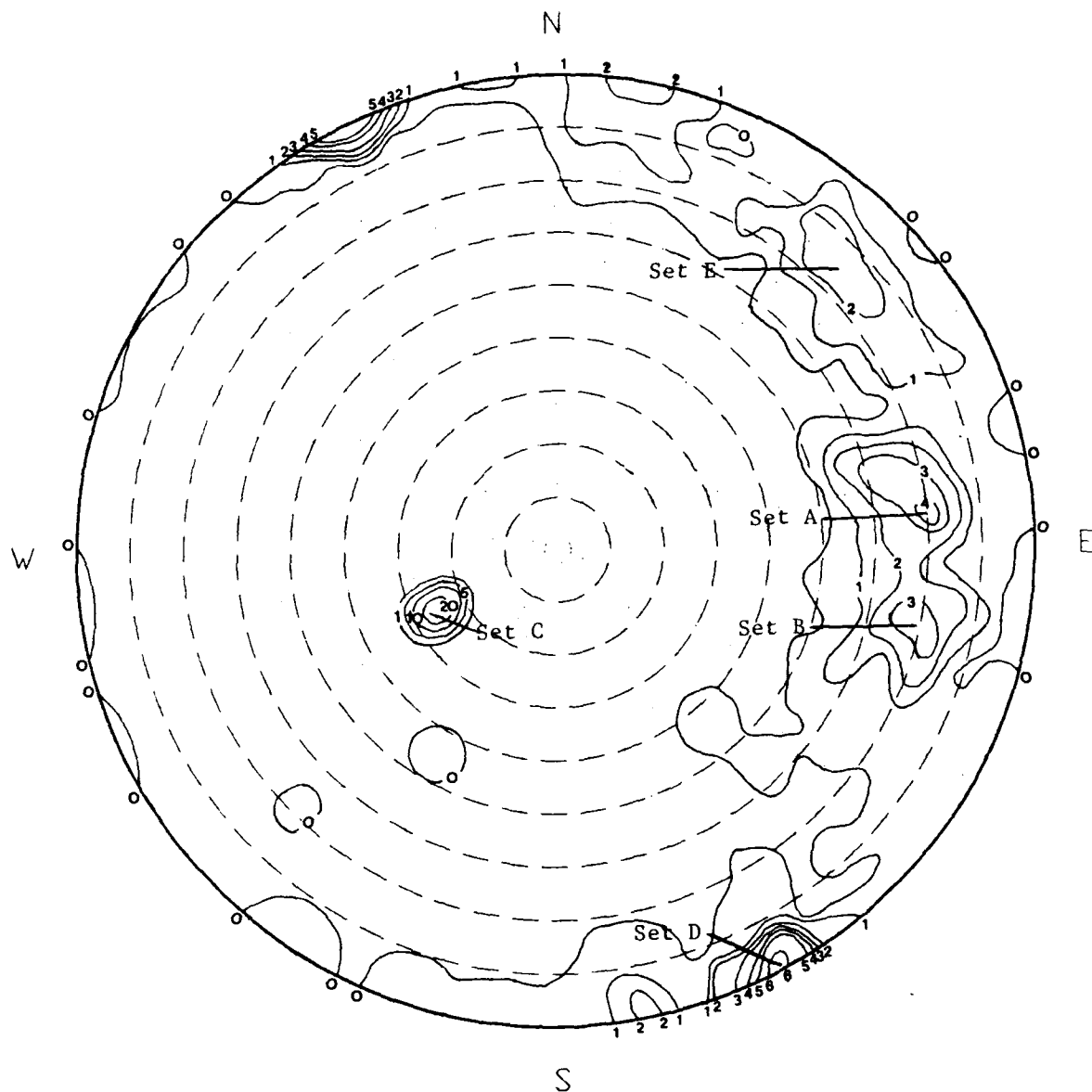
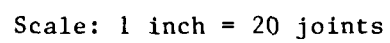


Figure C-2 Stereonet of Joints Exposed on the Right Abutment of the RCC Dam

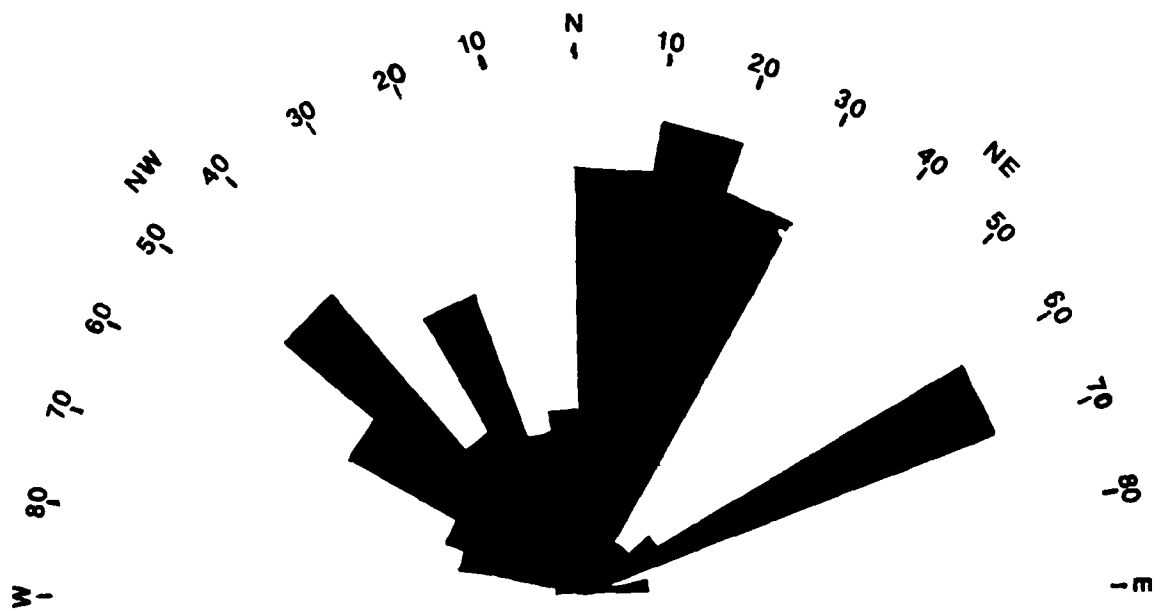


Note: Contours represent percent of 479 mapped joints

Figure C-3 Stereonet of Joints Exposed on the Left Abutment of the RCC Dam



C-14



Scale: 1 inch = 20 joints

Figure C-5 Joint Rosette of Joints Exposed on the Right Abutment of the RCC Dam

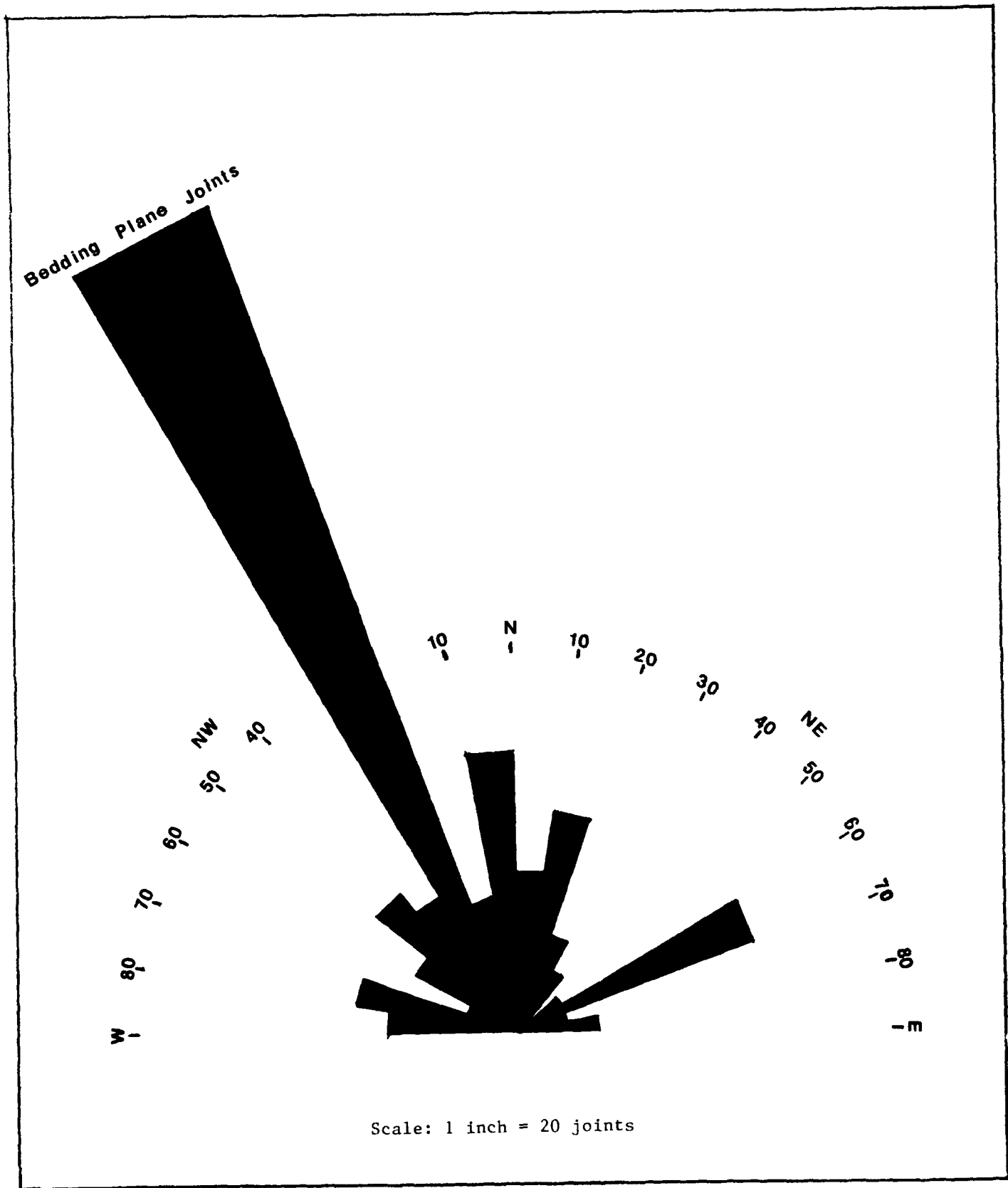


Figure C-6 Joint Rosette of Joints Exposed on the Left Abutment of the RCC Dam

APPENDIX D
FOUNDATION MAPS

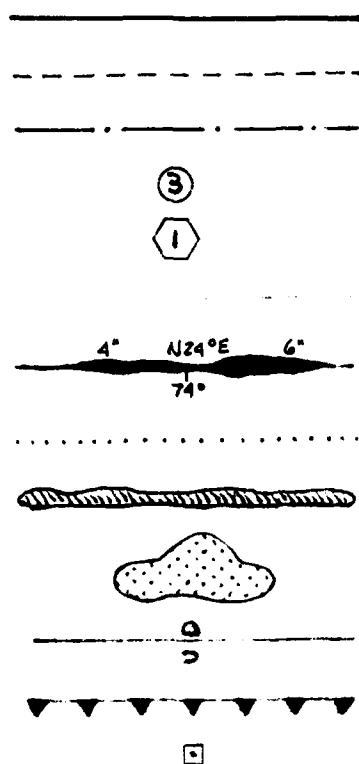
APPENDIX D
TABLE OF CONTENTS

Plate Nos.	Description	Page No.
D-1 thru D-19	RCC DAM LEFT ABUTMENT	D-2
D-20 thru D-24	RCC DAM CHANNEL BOTTOM	D-22
D-25 thru D-37	RCC DAM RIGHT ABUTMENT	D-28
D-38 thru D-47	AUXILIARY SPILLWAY LEFT SIDE	D-42
D-48 thru D-52	AUXILIARY SPILLWAY SILL CUT.....	D-53
D-53 Thru D-63	AUXILIARY SPILLWAY CHUTE TOE.....	D-59
D-64	RCC Dam Foundation Mapped.....	D-70

RCC DAM LEFT ABUTMENT

TABLE OF CONTENTS
RCC DAM LEFT ABUTMENT

Plate No.	Title	Page No.
D-1	RCC DAM LEFT ABUTMENT STA 0+00C to STA 0+35C.....	D-2
D-2	RCC DAM LEFT ABUTMENT STA 0+35C to STA 1+05C.....	D-3
D-3	RCC DAM LEFT ABUTMENT STA 1+05C to STA 1+70C.....	D-4
D-4	RCC DAM LEFT ABUTMENT DS STA 1+11C to STA 1+70C.....	D-5
D-5	RCC DAM LEFT ABUTMENT HLOW STA 1+40D to STA 2+05D.....	D-6
D-6	RCC DAM LEFT ABUTMENT HLOW STA 2+05D to STA 2+60D.....	D-7
D-7	RCC DAM LEFT ABUTMENT STA 2+02C to STA 2+11C.....	D-8
D-8	RCC DAM LEFT ABUTMENT DS STA 2+05C to STA 2+11C.....	D-9
D-9	RCC DAM LEFT ABUTMENT INT. BENCH STA 1+40D to STA 1+90D.....	D-10
D-10	RCC DAM LEFT ABUTMENT INT. BENCH STA 1+90D to STA 2+25D.....	D-11
D-11	RCC DAM LEFT ABUTMENT STA 2+41C to STA 2+56C.....	D-12
D-12	RCC DAM LEFT ABUTMENT DS STA 2+41C to STA 2+56C.....	D-13
D-13	RCC DAM LEFT ABUTMENT LLOW STA 1+24D to STA 1+90D.....	D-14
D-14	RCC DAM LEFT ABUTMENT LLOW STA 1+90D to STA 2+45D.....	D-15
D-15	RCC DAM LEFT ABUTMENT LLOW STA 2+45D to STA 3+10D.....	D-16
D-16	RCC DAM LEFT ABUTMENT STA 2+83C to STA 2+95C.....	D-17
D-17	RCC DAM LEFT ABUTMENT DS STA 2+83C to STA 2+95C.....	D-18
D-18	RCC DAM LEFT ABUTMENT DS STA 2+88.5C to STA 3+00C.....	D-19
D-19	RCC DAM LEFT ABUTMENT DS STA 2+76C to STA 2+88C.....	D-20



STA 0+00C
4695'

LEGEND

Limits of Excavation and/or Mapping

Matchline or Offset

Contact Between Stratigraphic Units

Rock Unit (number matches Table C-1)

Rock Unit (number matches Table C-2)

Vein or Healed Joint

Joint with Strike and Dip
Thickness Over 1 Inch Drawn to Scale

Bedding Plane Joint

Chert

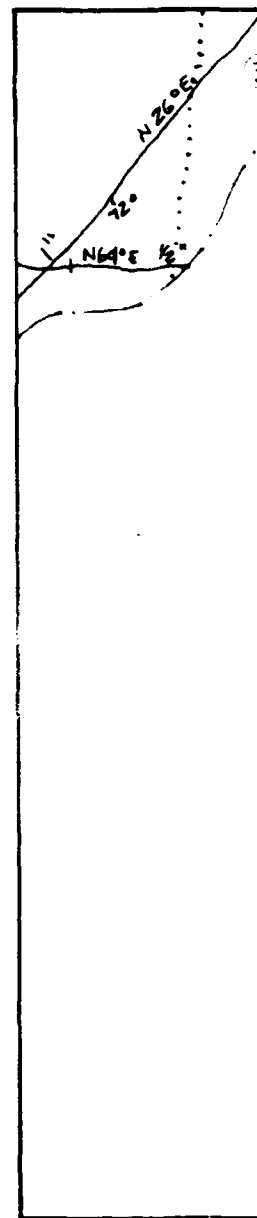
Altered Material Removed During
Foundation Preparation

Fault Showing Relative Movement

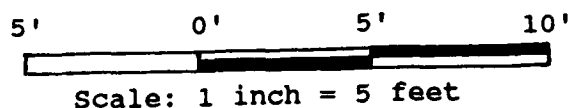
Thrust Fault, Teeth on Upthrown Block

Rockbolt

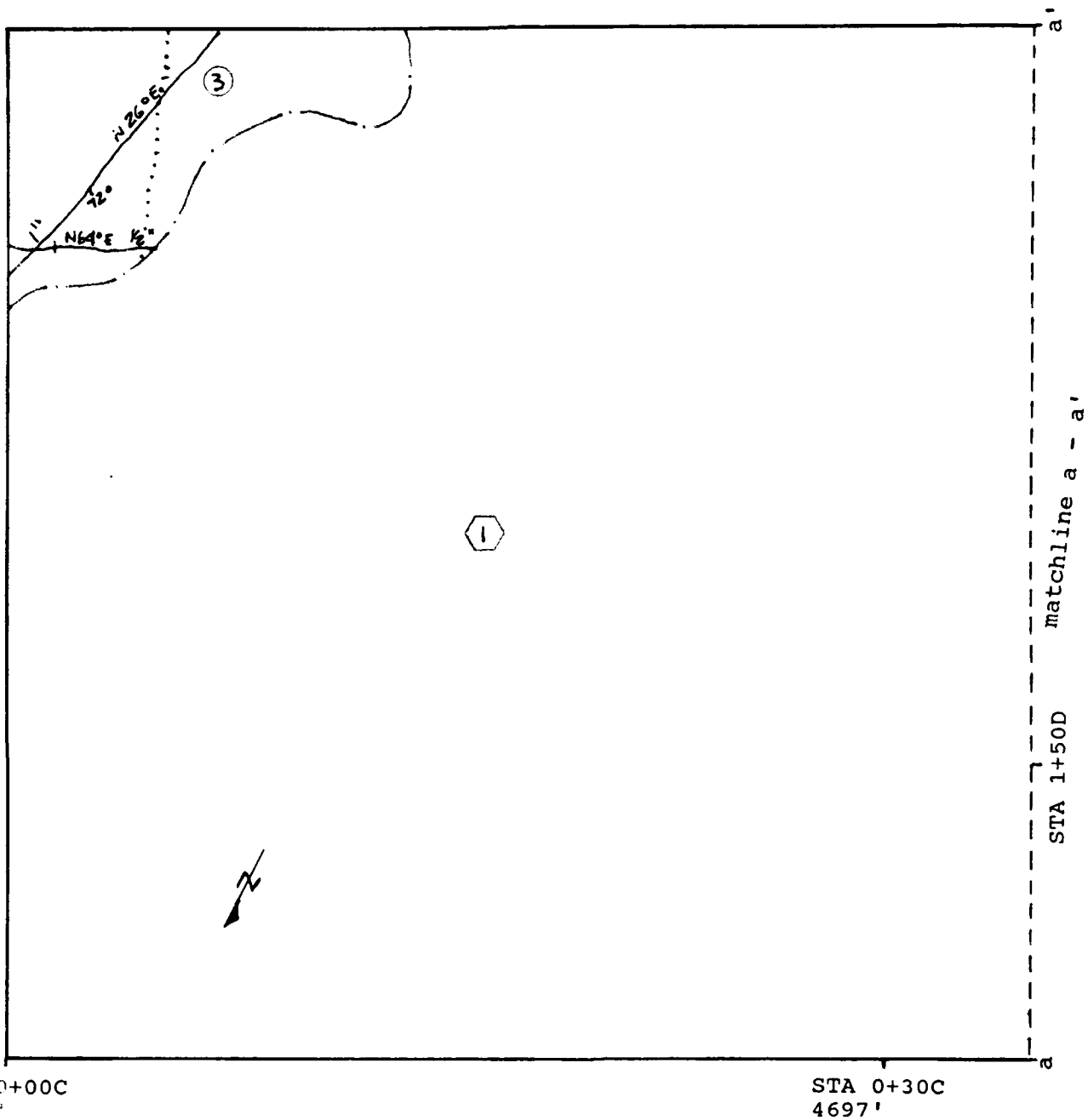
Horizontal Station Number with
Corresponding Elevation. Sta-
tioning Matches Dam Axis (C)
or Spillway Axis (D).





STA 0+00C
4695'



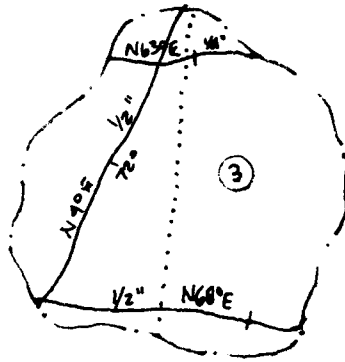
Note: For orientation, horizontal or near
north arrow; vertical or near-vertical
view.



tion, horizontal or near-horizontal planes have
ical or near-vertical planes have direction of

 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	210 ENGINE & TEST FACILITIES TENTS OR CONSTRUCTION, E.M.	
DWG. BY <u>CSD</u>	COCHILLO NEGRO DAM Foundation Report	
CHK. BY <u>10/28</u>	FOUNDATION MAP RCC DAM LEFT ABUTMENT STA 0+00C TO STA 0+35C	
DATE: <u>6 Oct 92</u> <i>David E. Wright</i>		Plate No. D-1

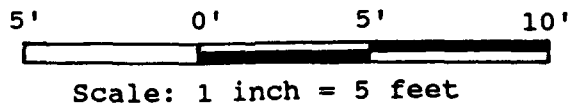
a' matchline a - a' a



1

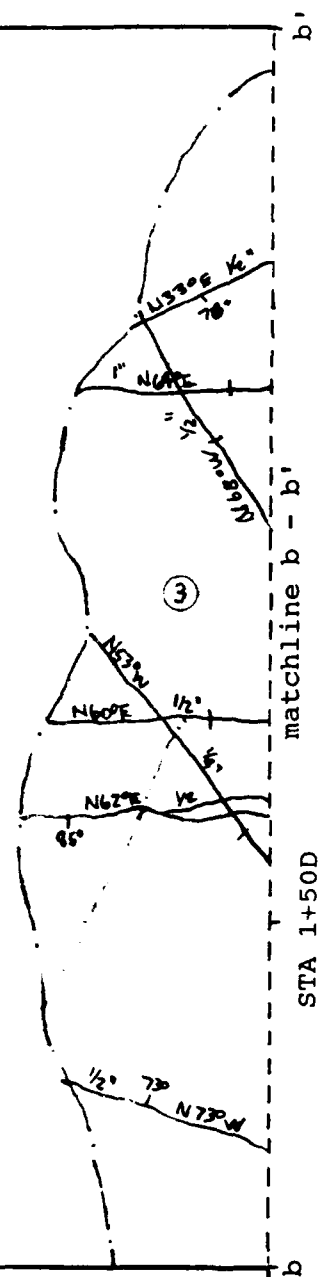




STA 0+40C
4698'

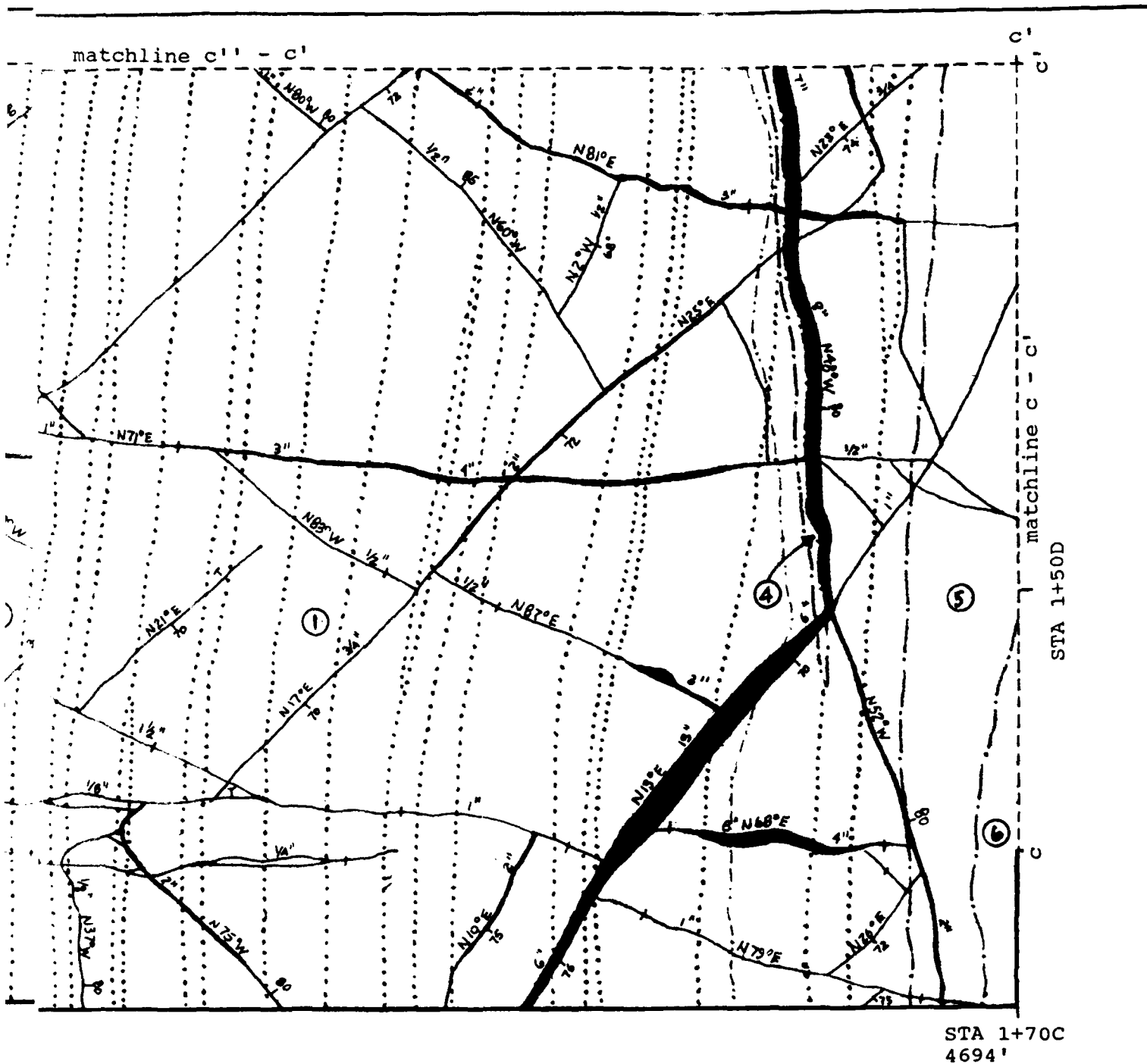




S'

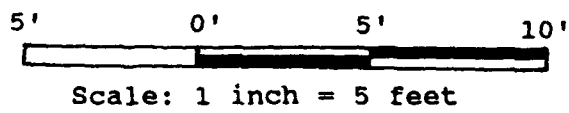
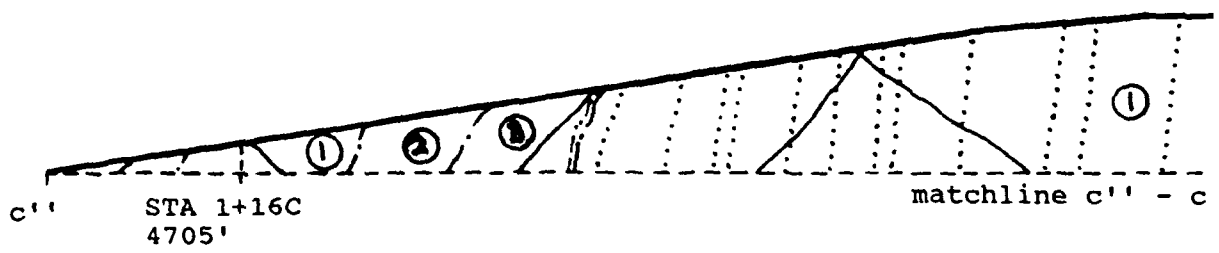
STA 0+80C

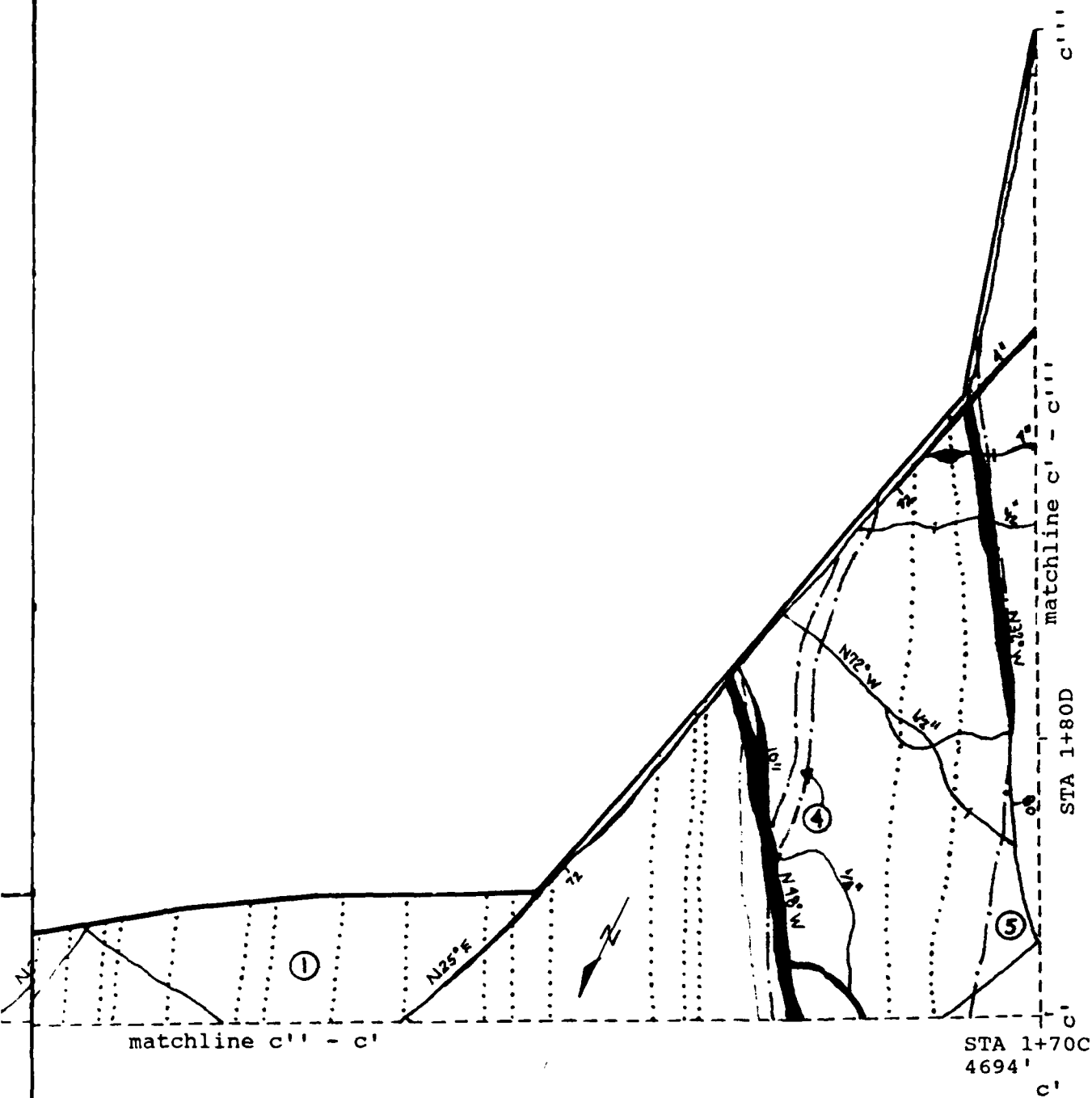
STA 1+05C
4705'



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	510 GRADE & TIE-INS TIE-INS TO EXISTING, P.A.	
CHK. BY CSD	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY HSA	RCC DAM LEFT ABUTMENT STA 0+33C to STA 1+05C	
David E. Knight DISTRICT DATE: 6 Oct 92		Plate No. D-2

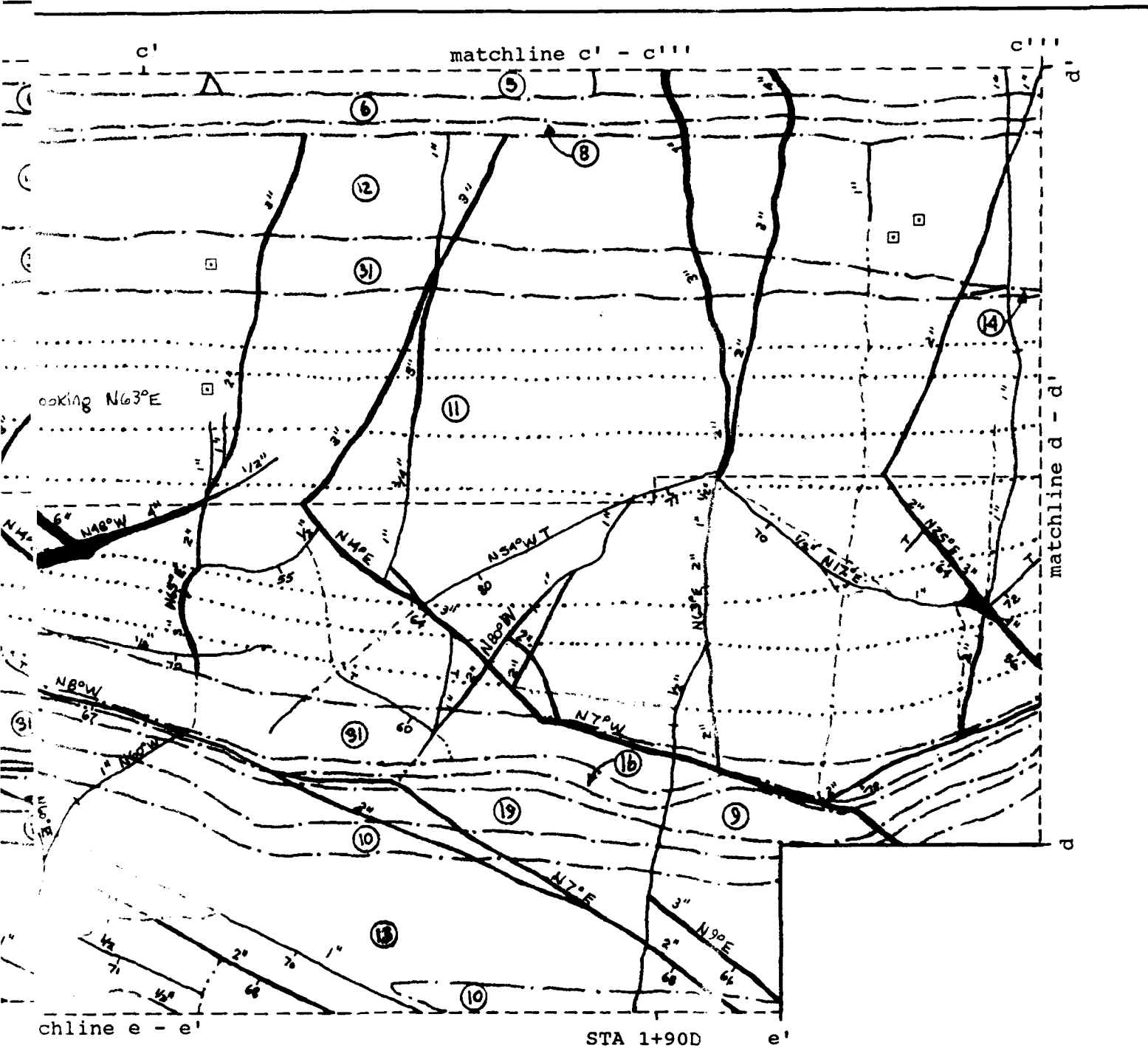


 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CAD	THE BRIDGE & TOWERWORKS TOWER OR CONSTRUCTION, E.R.	
DES. BY CAD	CUCHILLO NEGRO DAM Foundation Support FOUNDATION MAP	
DES. BY CAD	RCC DAM LEFT ABUTMENT STA 1+05C to STA 1+71C	
David E. Wright DATE: 6-27-92		Plate No. D-3

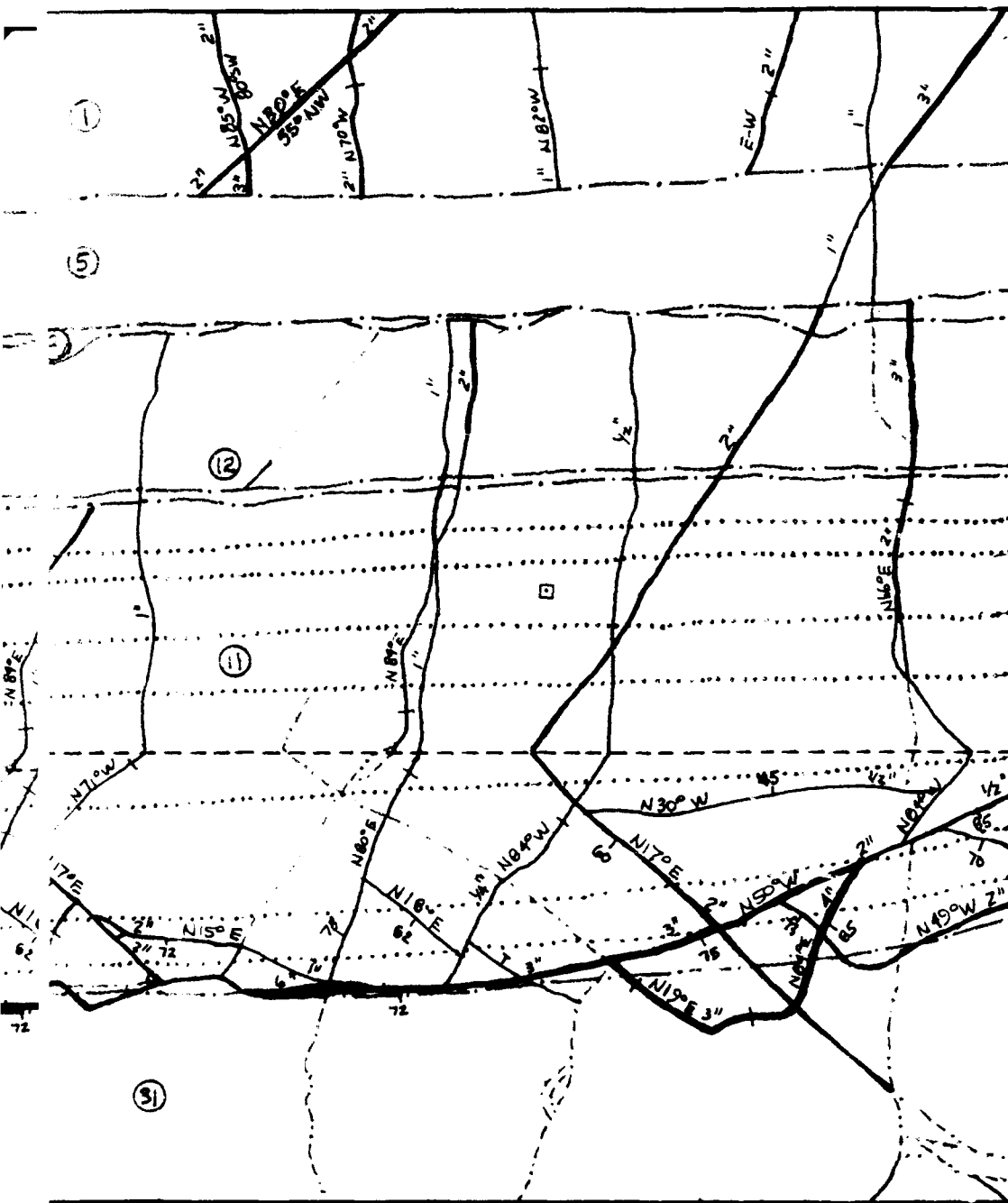






 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	SITE CHANGES & REVISIONS	
DES. BY CSD	THOTS OR CORRECTIONS, E.R.	
CHK. BY W 56	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP RCC DAM LEFT ABUTMENT DS STA 1+11C to STA 1+70C	
David E. Wright DATE: 6 OCT 92		Plate No. D-4



U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <i>CSB</i>	670 BRIDGE & TOWER/PIERS TOWNSHIP OF CONCORDANCE, N.M.	
DES. BY <i>CSB</i>	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <i>MSB</i>	RCC DAM LEFT ABUTMENT BELOW STA 1+400 to STA 2+050	
David E. Wright DATE: <i>Oct 92</i>		Plate No. D-5

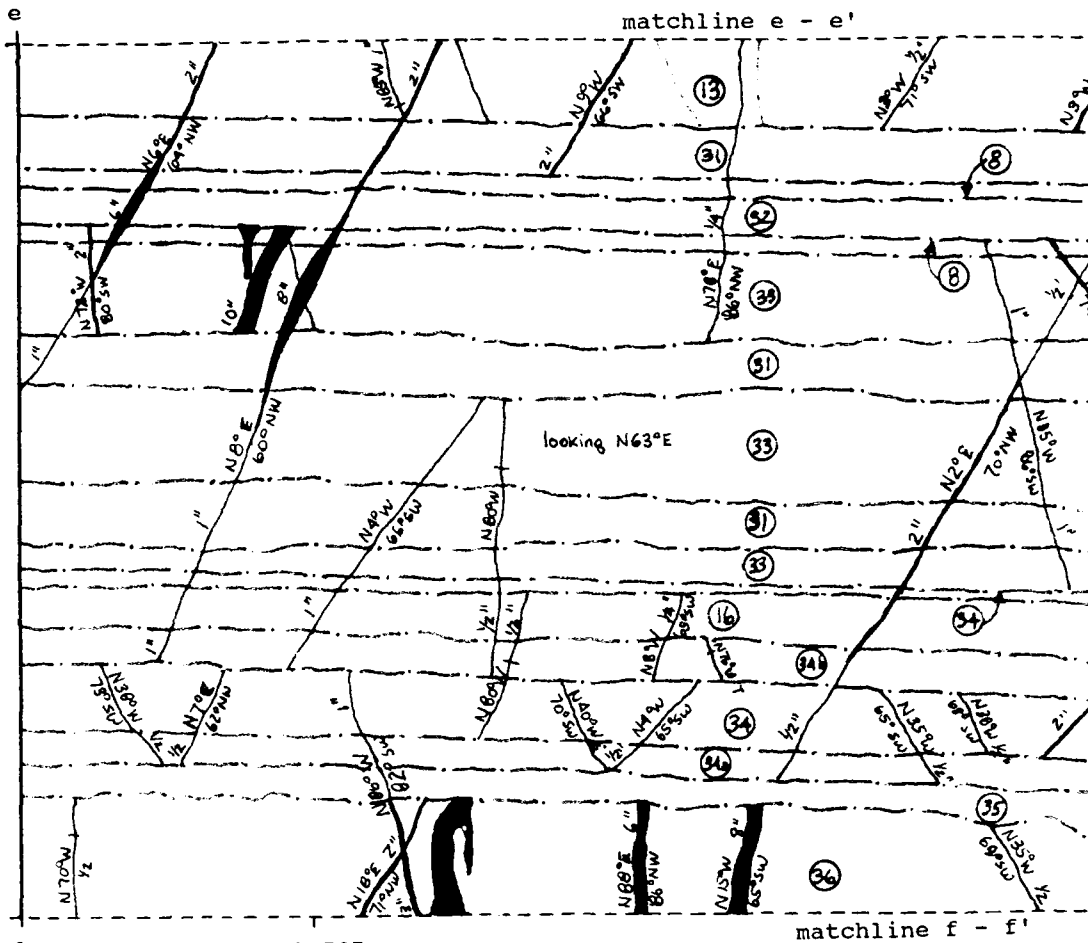


STA 2+50D

 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CAD DES. BY CAD CHE. BY W2B	TITLE OF DRAWING ROUTE OF CONSTRUCTION, U.S.	
CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP		
RCC DAM LEFT ABUTMENT HIOW STA 2+05D to STA 2+60D		
<i>David E. Wright</i> DATE: 6 Oct 92		Plate No. D-6

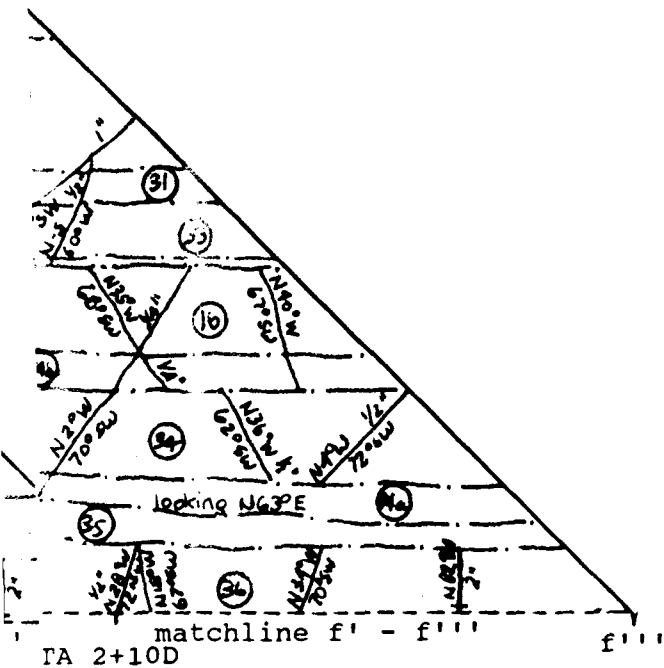
STA 2+02C
4678'



STA 2+11C
4649'

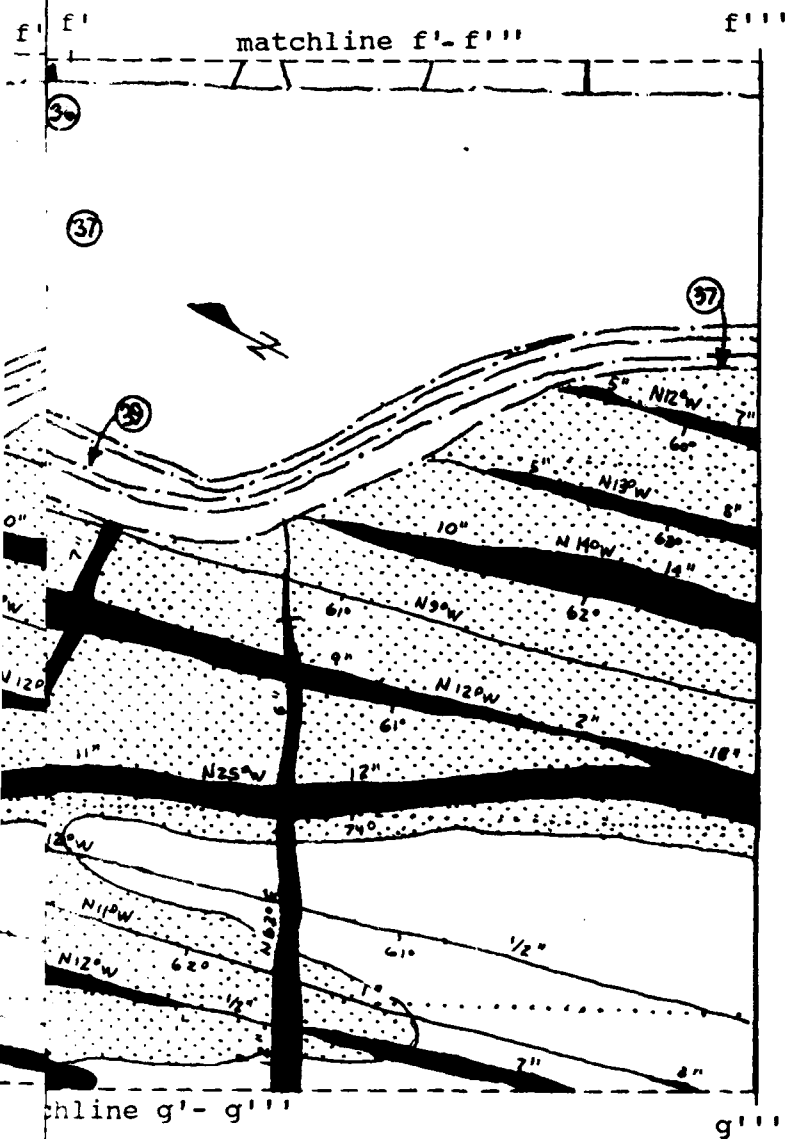




5' 0' 5' 10'

Scale: 1 inch = 5 feet



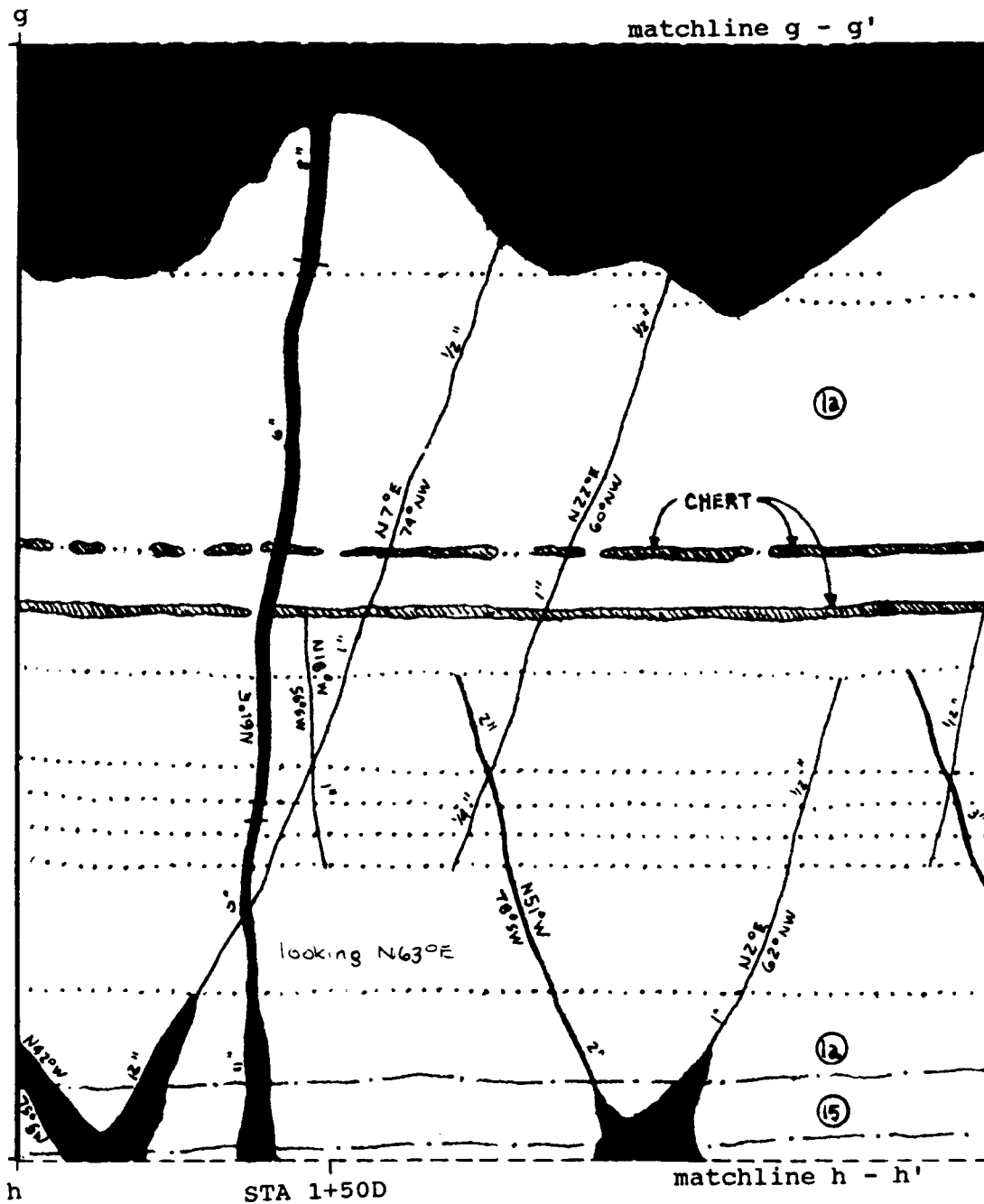
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	DIVISION & TRIBUTARIES CUCHILLO NEGRO DAM	
DES. BY <u>CAD</u>	FOUNDATION REPORT FOUNDATION MAP	
CHK. BY <u>W.S.</u>	RCC DAM LEFT ABUTMENT DS STA 2+05C to STA 2+11C	
DATE: <u>Oct 92</u>		Plate No. D-8

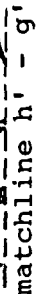




 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CND	630 GRADES & TIEPOINTS TYPED BY CHIEF ENGINEER, U.S.	
DES. BY CND	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
DES. BY W56	RCC DAM LEFT ABUTMENT INT. BENCH STA 1+900 to STA 2+250	
David E. Wright DATE: 6 Oct 92		Plate No. D-10

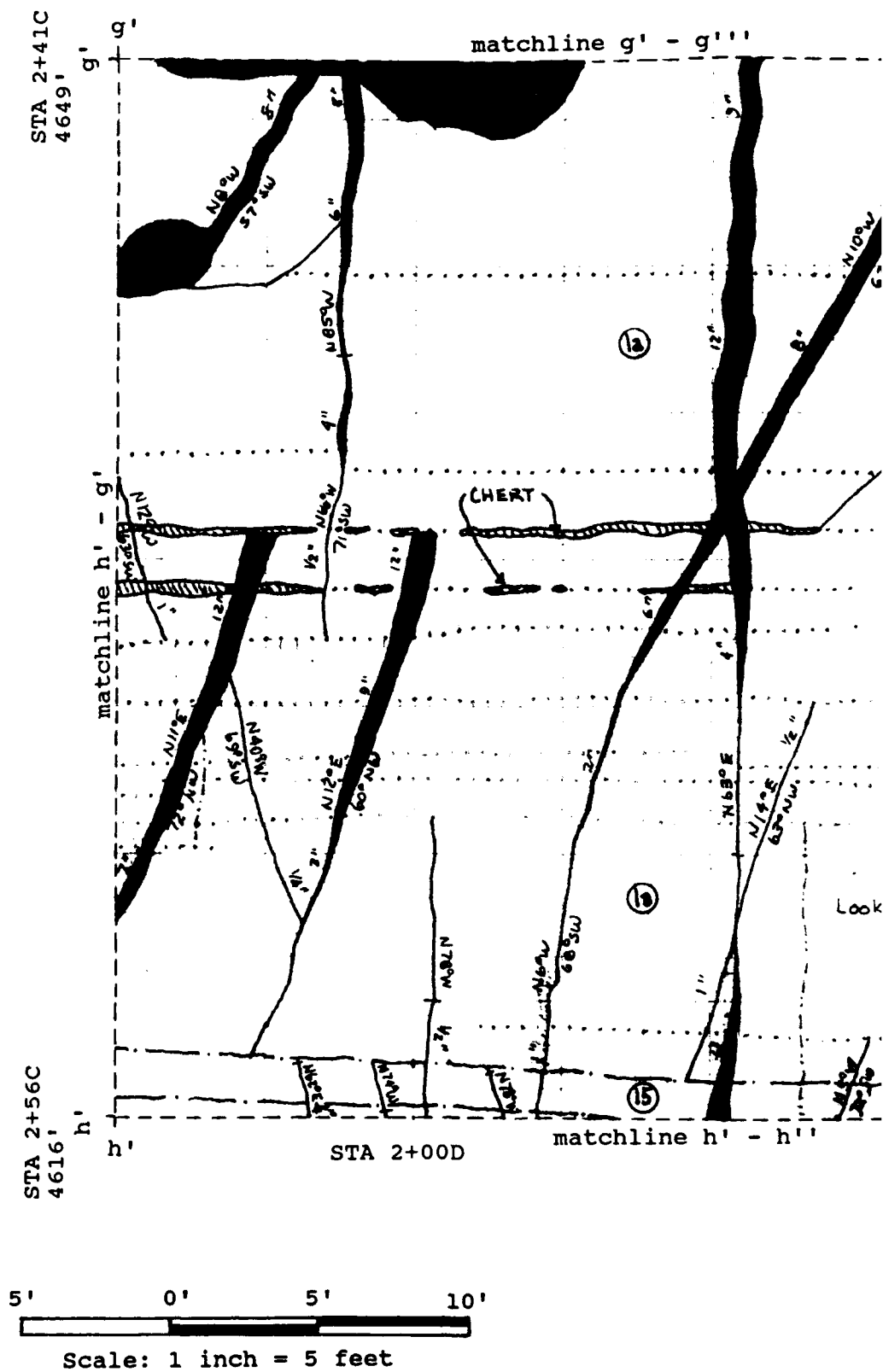
STA 2+41C
4649'

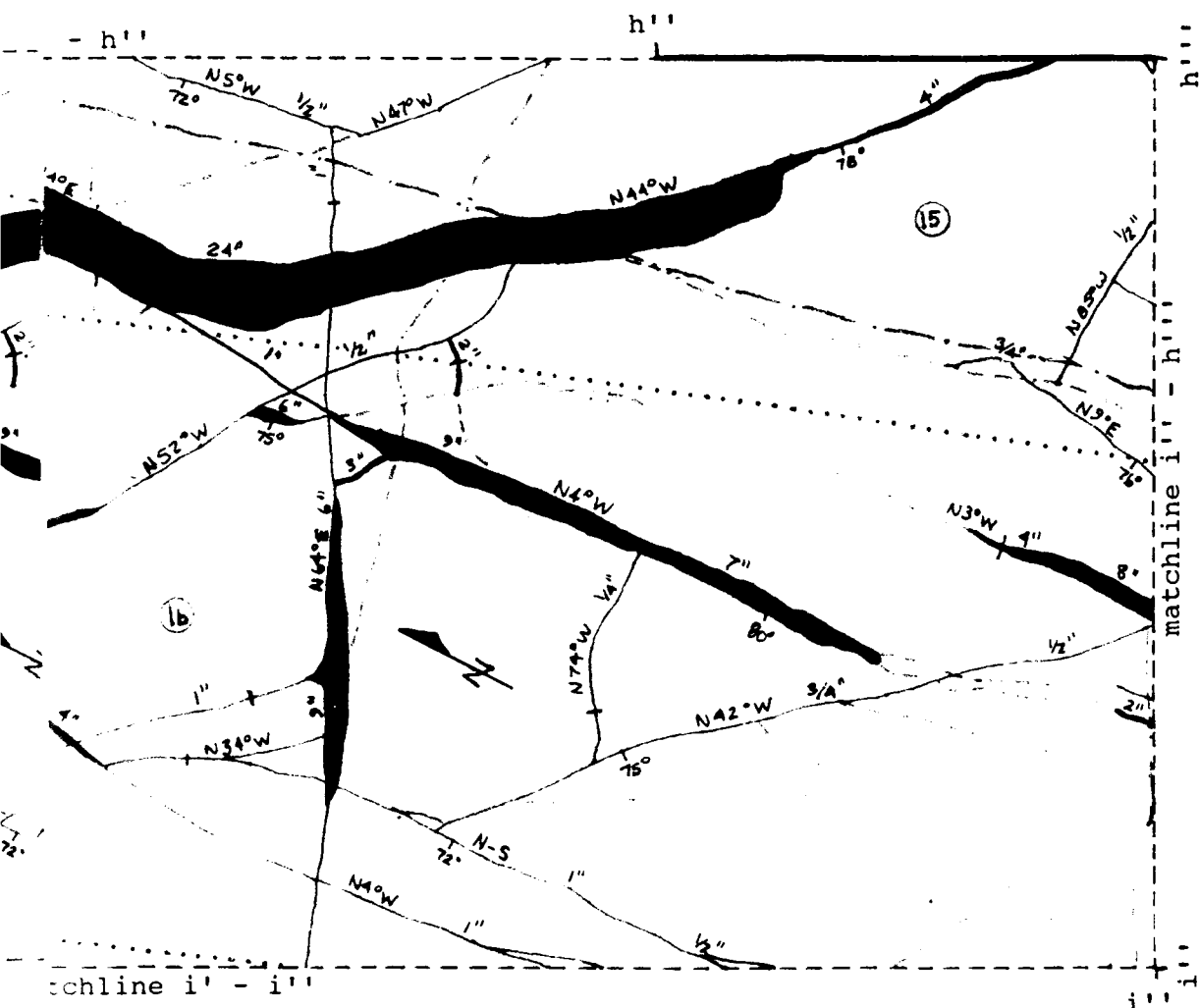
STA 2+56C
4616'





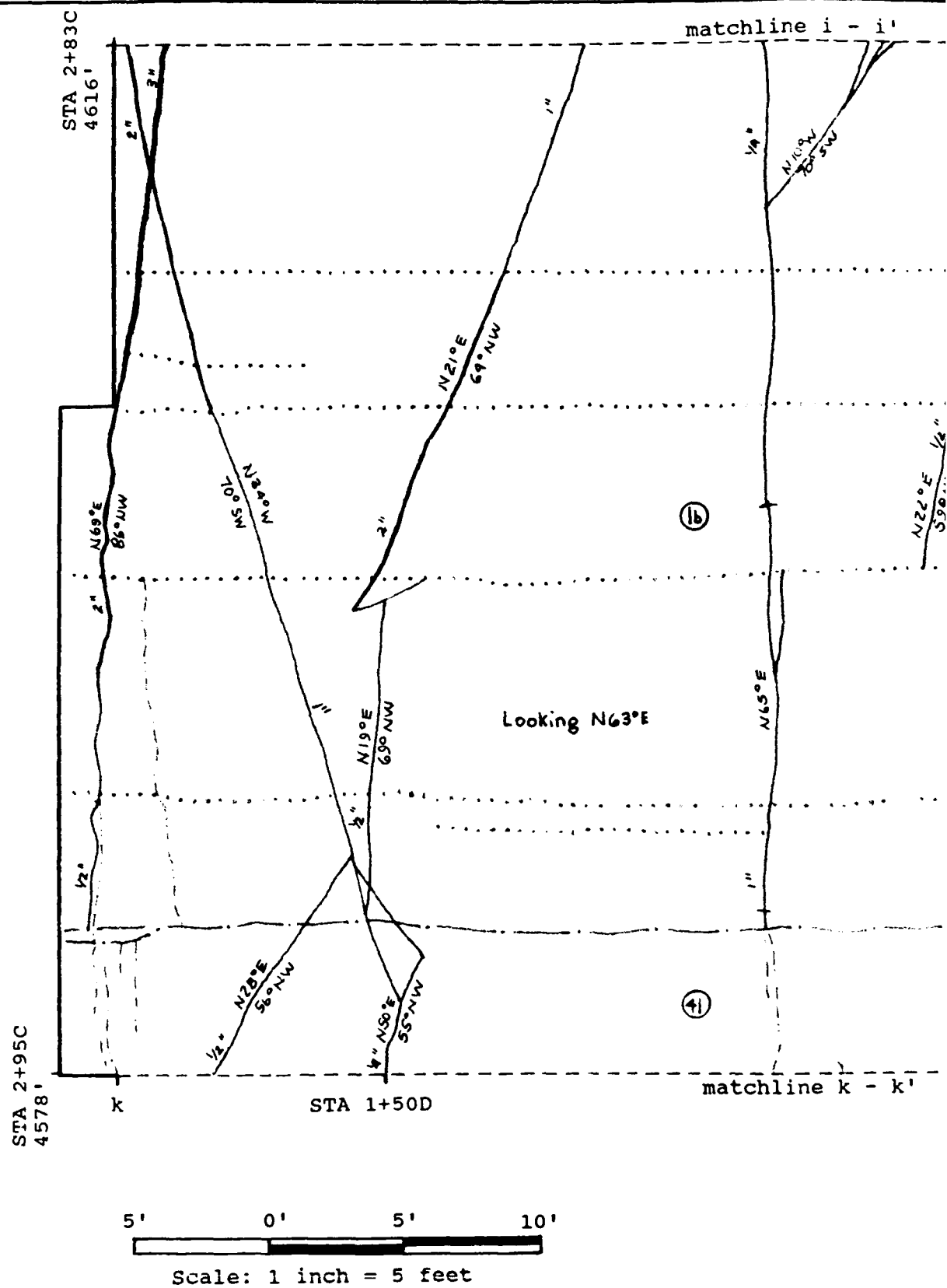
$$\frac{g'}{g' + g}$$

$$h'$$

	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
NO. 07 <u>CSD</u>	210 GRADE & TRIANGULO		
NO. 07 <u>CSD</u>	FOOTING ON CONCRETE, S.B.		
NO. 07 <u>MSB</u>	CUCILLO NEGRO DAM Foundation Report FOUNDATION MAP		
RCC DAM LEFT ABUTMENT STA 2+41C TO STA 2+56C			
David E. Wright ENGINEER DATE: <u>APR 92</u>			Plate No. D-11





 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY	610 GRADE & TRIBUTARIES TERRY DE CONDELLERES, U.S.	
CHK. BY	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
DATE	RCC DAM LEFT ABUTMENT LLOW STA 1+900 to STA 2+450	
DAVID E. WRIGHT DATE: 6 Oct 92		Plate No. D-14





matchline i - i'

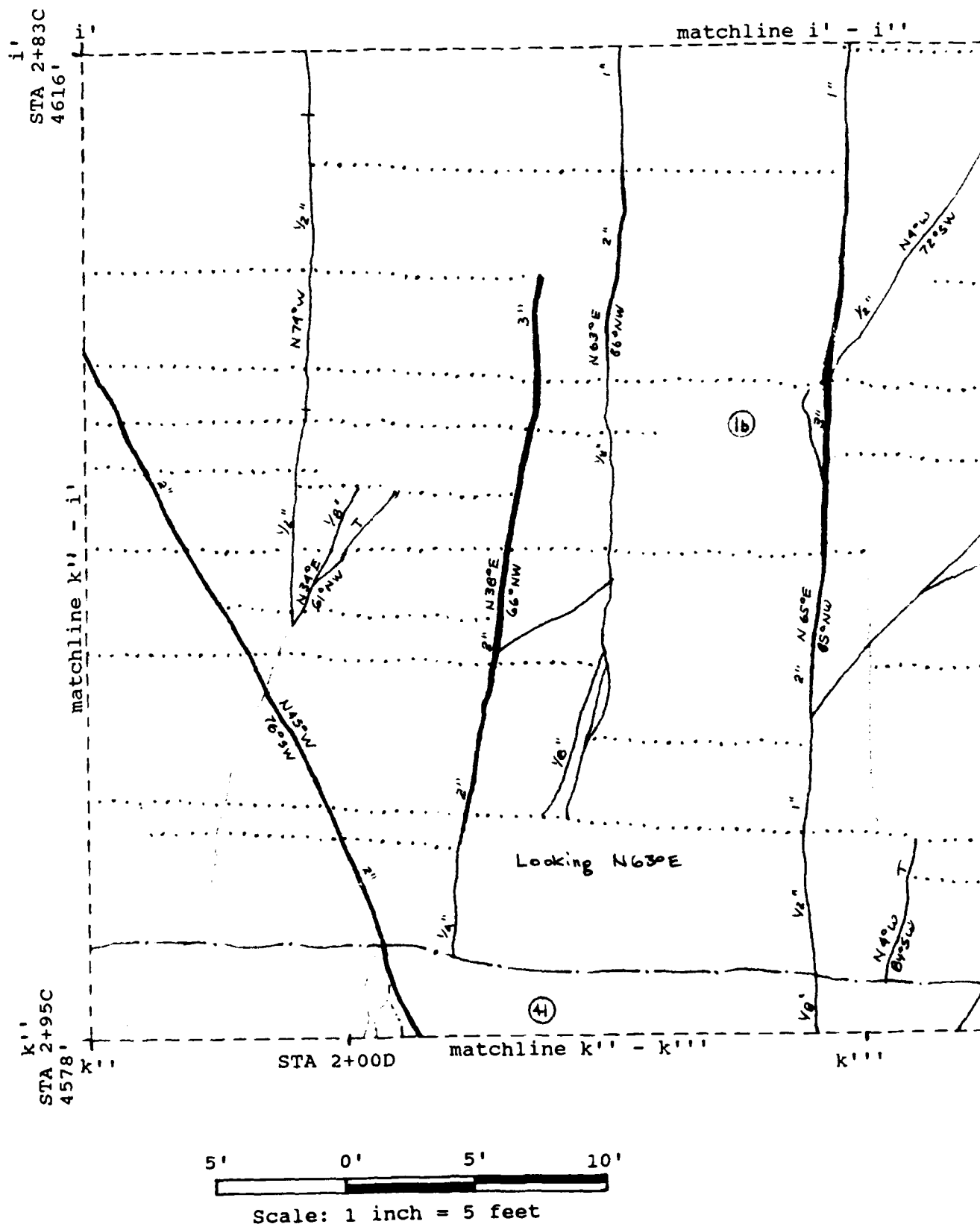
i'

matchline k' - i'

matchline k - k'

k' matchline k' - k'' k''

 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY C.D.	TYPE DRAWING & TITLE FOUNDATION MAP	
DES. BY C.D.	PROJECT OR ORIGINATING A.G. CUCHILLO NEGRO DAM	
DES. BY W.S.	FOUNDATION REPORT RCC DAM LEFT ABUTMENT STA 2+83C to STA 2+95C	
DATE 6-2-72		Plate No. D-16



STA 3+00.5C
4578'

matchline 1 - i'''

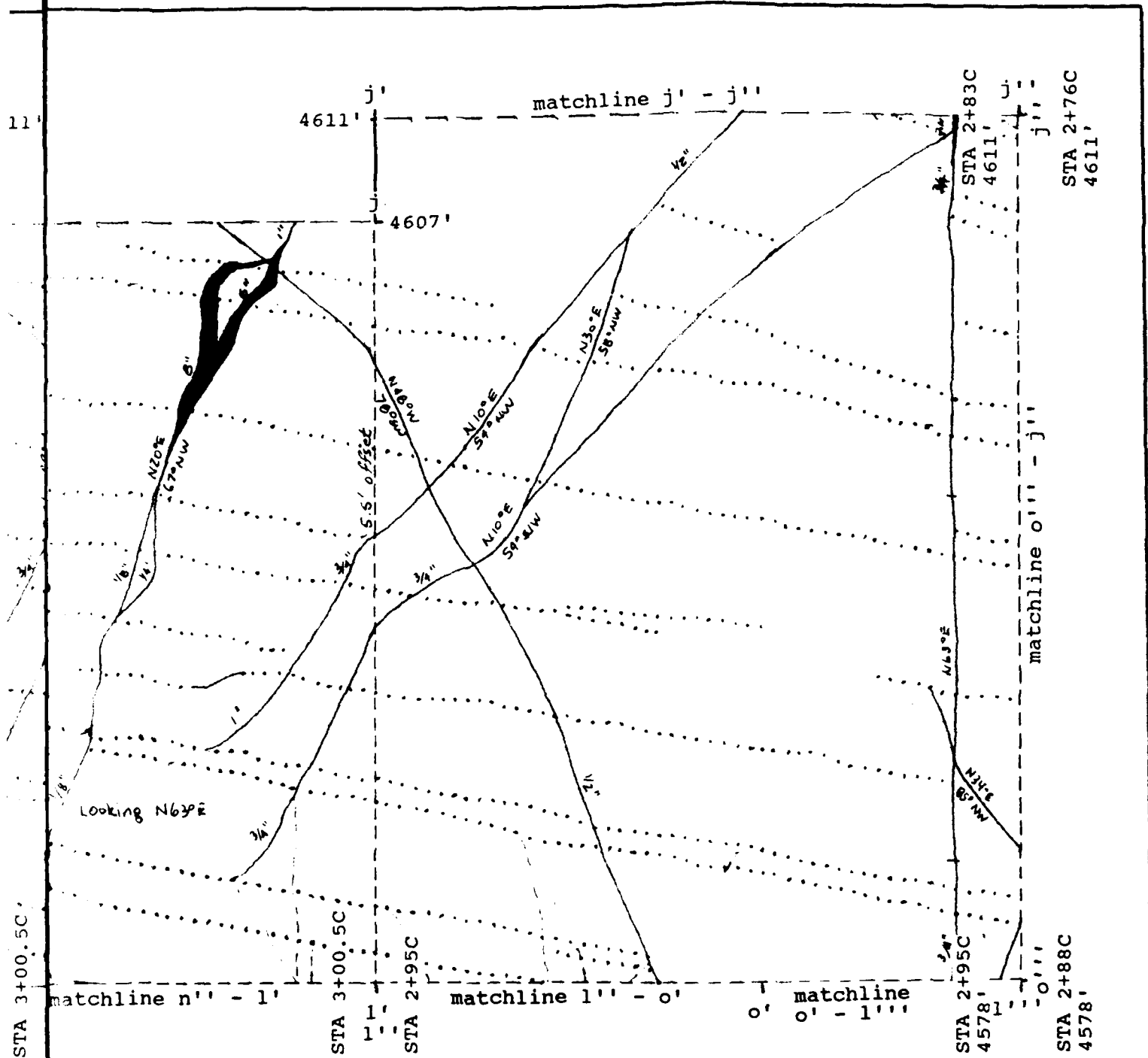
matchline i''' - j



matchline n' - n''

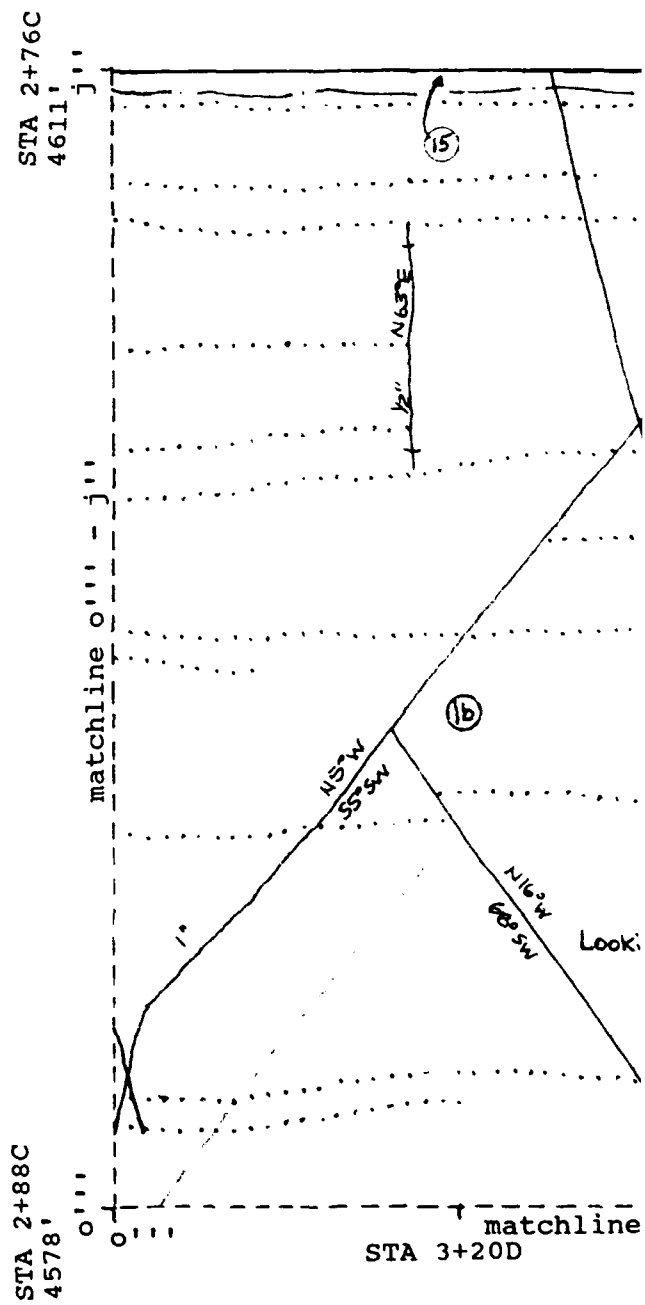
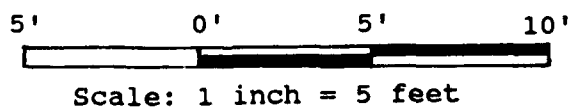
STA 2+70D matchline n'' - 1'

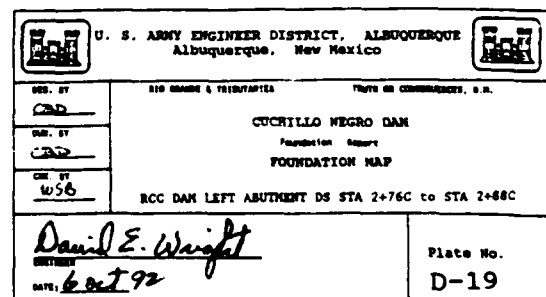


Scale: 1 inch = 5 feet



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <i>CD</i>	SVO DRAWING & TRANSMITTAL TYPED ON COMBINATION, S.A.	
CHK. BY <i>CD</i>	COCHILLO NEGRO DAM Foundation Report	
DATE <i>12/80</i>	FOUNDATION MAP RCC DAM LEFT ABUTMENT DS STA 2+88.5C to STA 3+00C	
<i>David E. Wright</i> DATE: <i>6 Oct 92</i>		Plate No. D-18



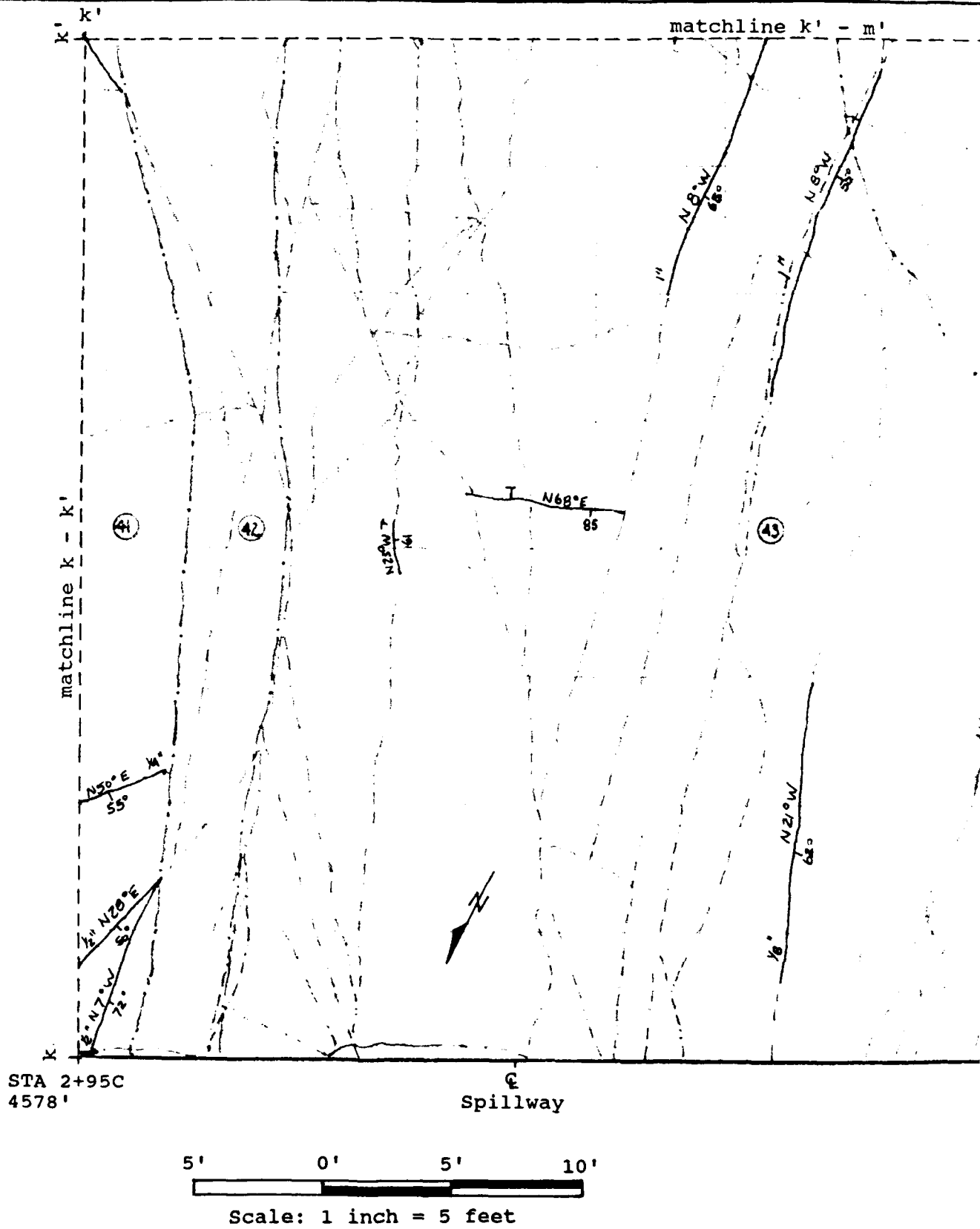


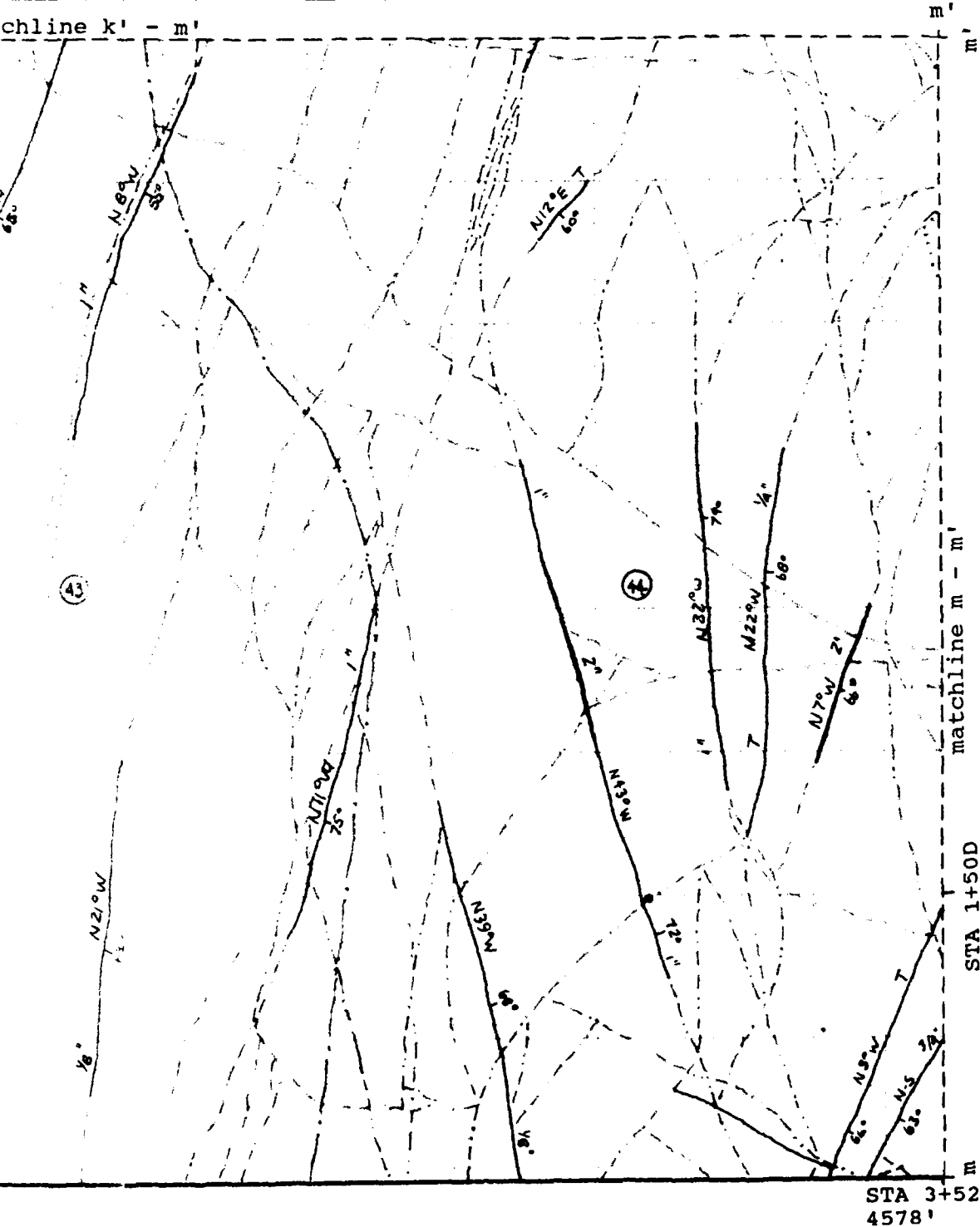
1

RCC DAM CHANNEL BOTTOM

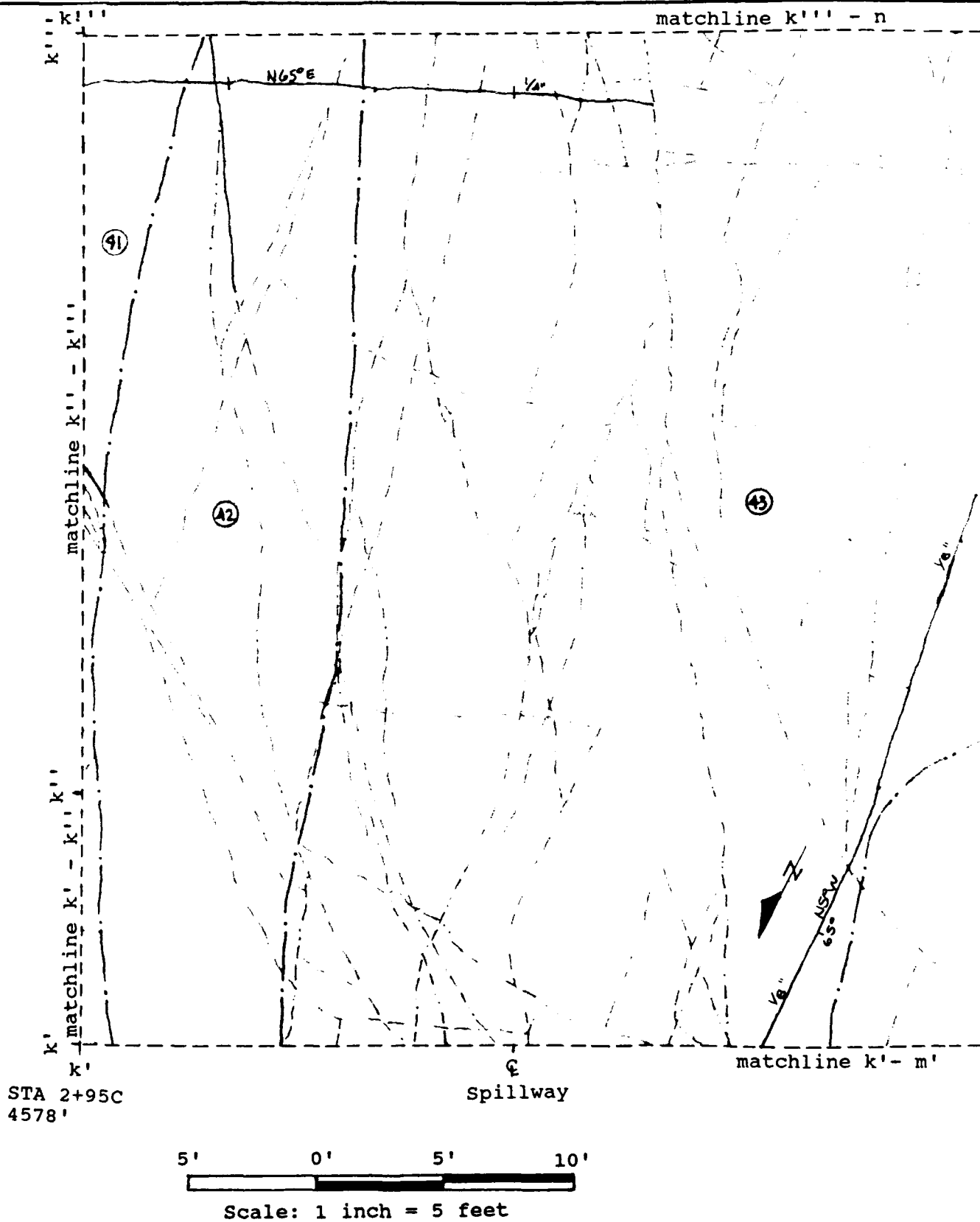
TABLE OF CONTENTS
RCC DAM CHANNEL BOTTOM

Plate No.	Title	Page No.
D-20	RCC DAM CHANNEL BOTTOM STA 1+40D to STA 1+80D.....	D-22
D-21	RCC DAM CHANNEL BOTTOM STA 1+80D to STA 2+20D.....	D-23
D-22	RCC DAM CHANNEL BOTTOM STA 2+20D to STA 2+60D.....	D-24
D-23	RCC DAM CHANNEL BOTTOM STA 2+60D to STA 3+00D.....	D-25
D-24	RCC DAM CHANNEL BOTTOM STA 3+00D to STA 3+40D.....	D-26

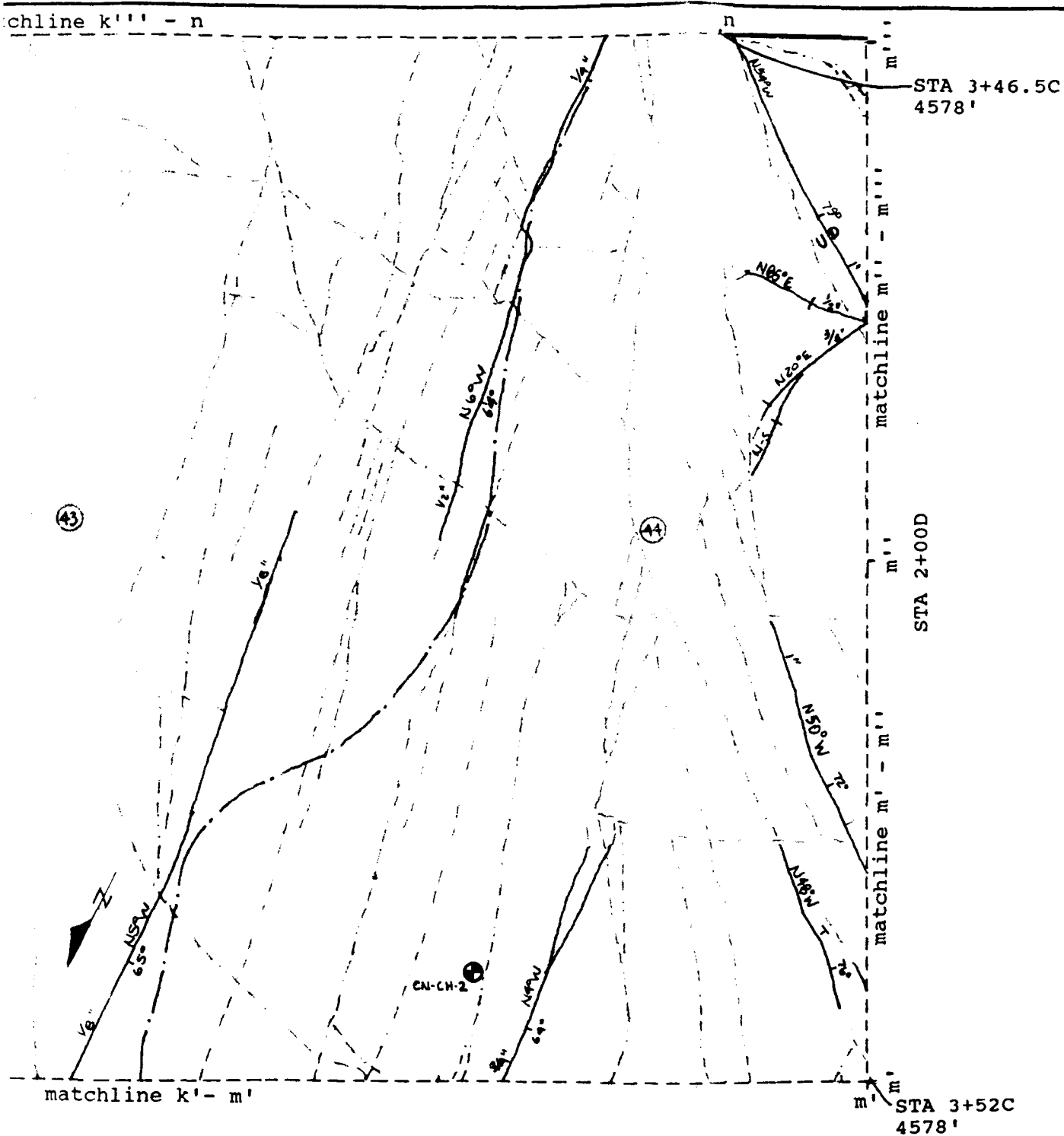






U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico	
DES. BY C.B.D.	R.C. DAM & TAILWATER TYPE OF CONSTRUCTION, U.S.
DES. BY C.B.D.	COCHILLO NEGRO DAM Foundation Report
CHK. BY W.S.B.	FOUNDATION MAP RCC DAM CHANNEL BOTTOM STA 1+40D to STA 1+80D
David E. Wright 6 Oct 92	
Plate No. D-20	



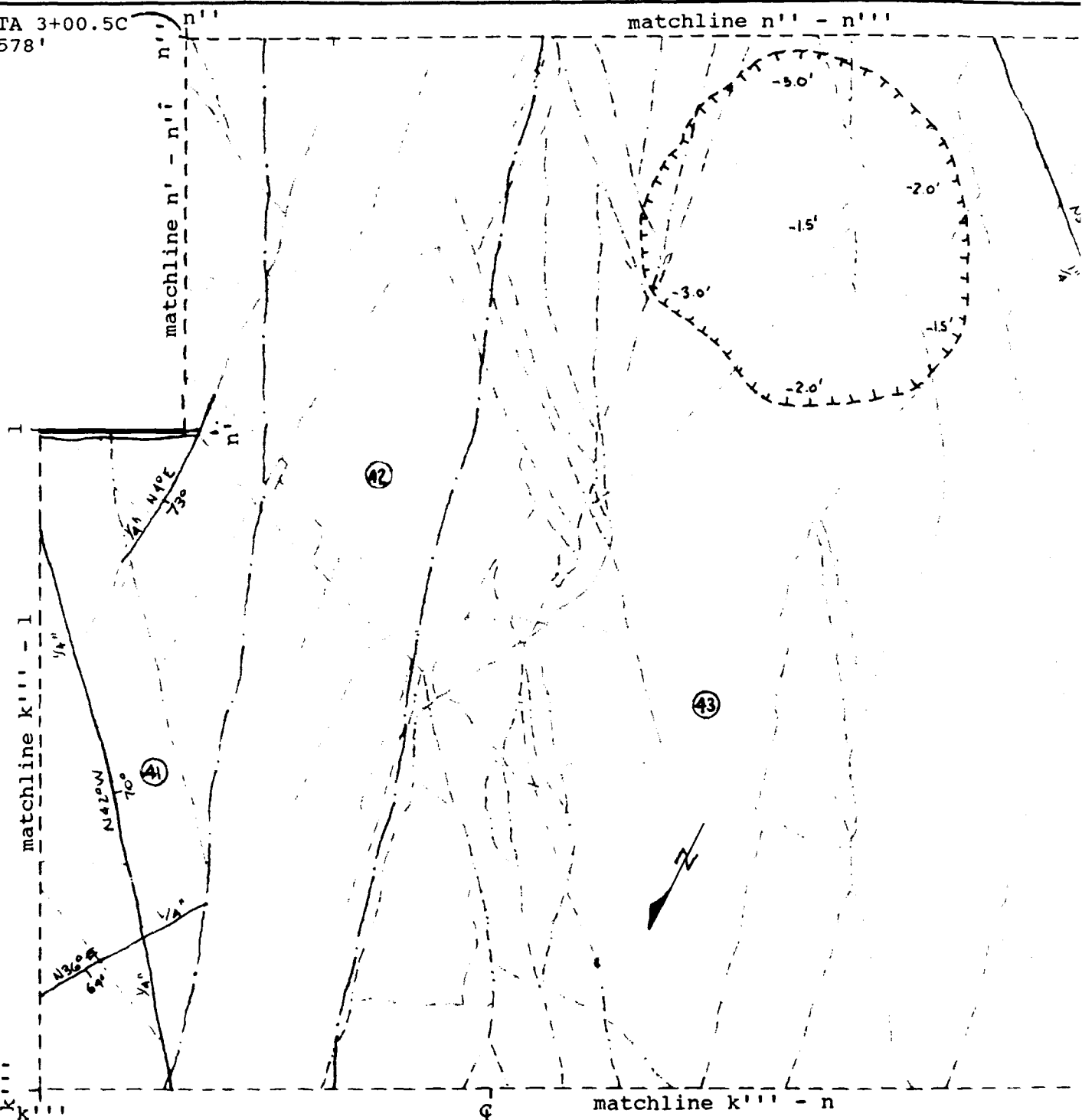
chline k''' - n



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CBD</u>	DIV. CHIEF & ASSISTANTS TYPED BY CHIEF, DISTRICT, U.S.	
CHK. BY <u>CBD</u>	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
DATE <u>10/26</u>	RCC DAM CHANNEL BOTTOM STA 1+800 to STA 2+200	
David E. Wright 6 Oct 92		Plate No. D-21

STA 3+00.5C
4578'

matchline n'' - n'''

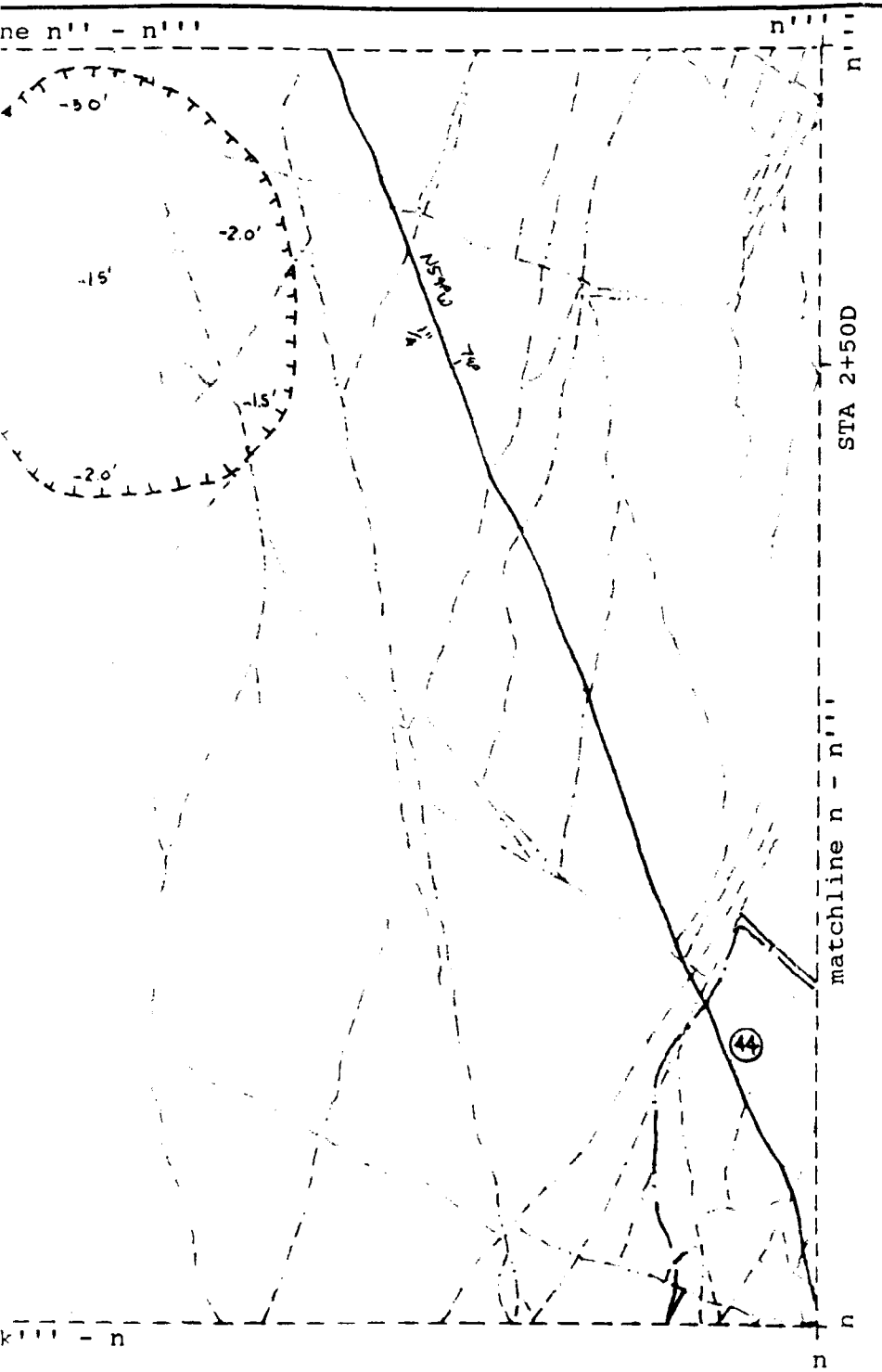


STA 2+95C
4578'

Spillway

5' 0' 5' 10'



Scale: 1 inch = 5 feet

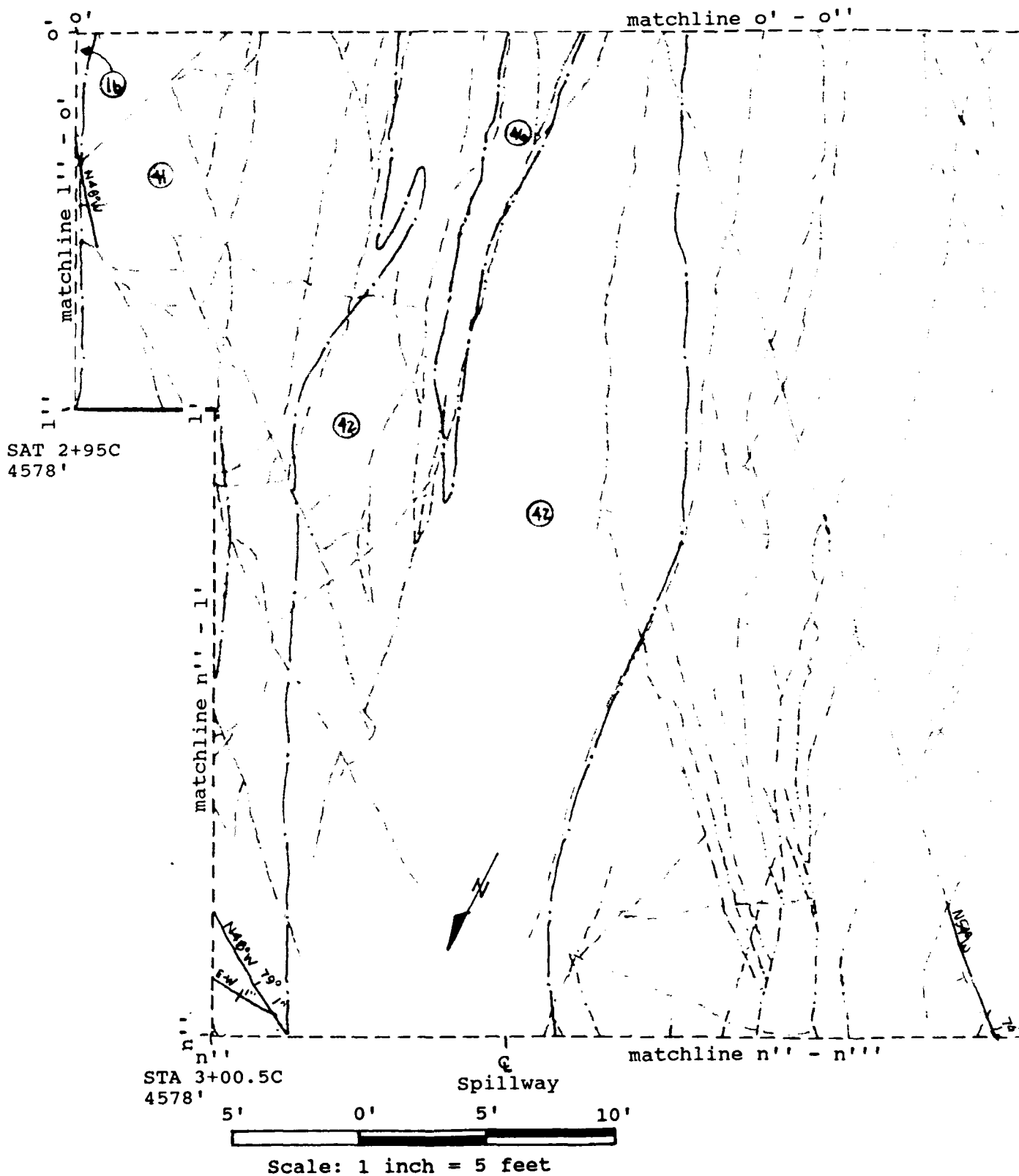


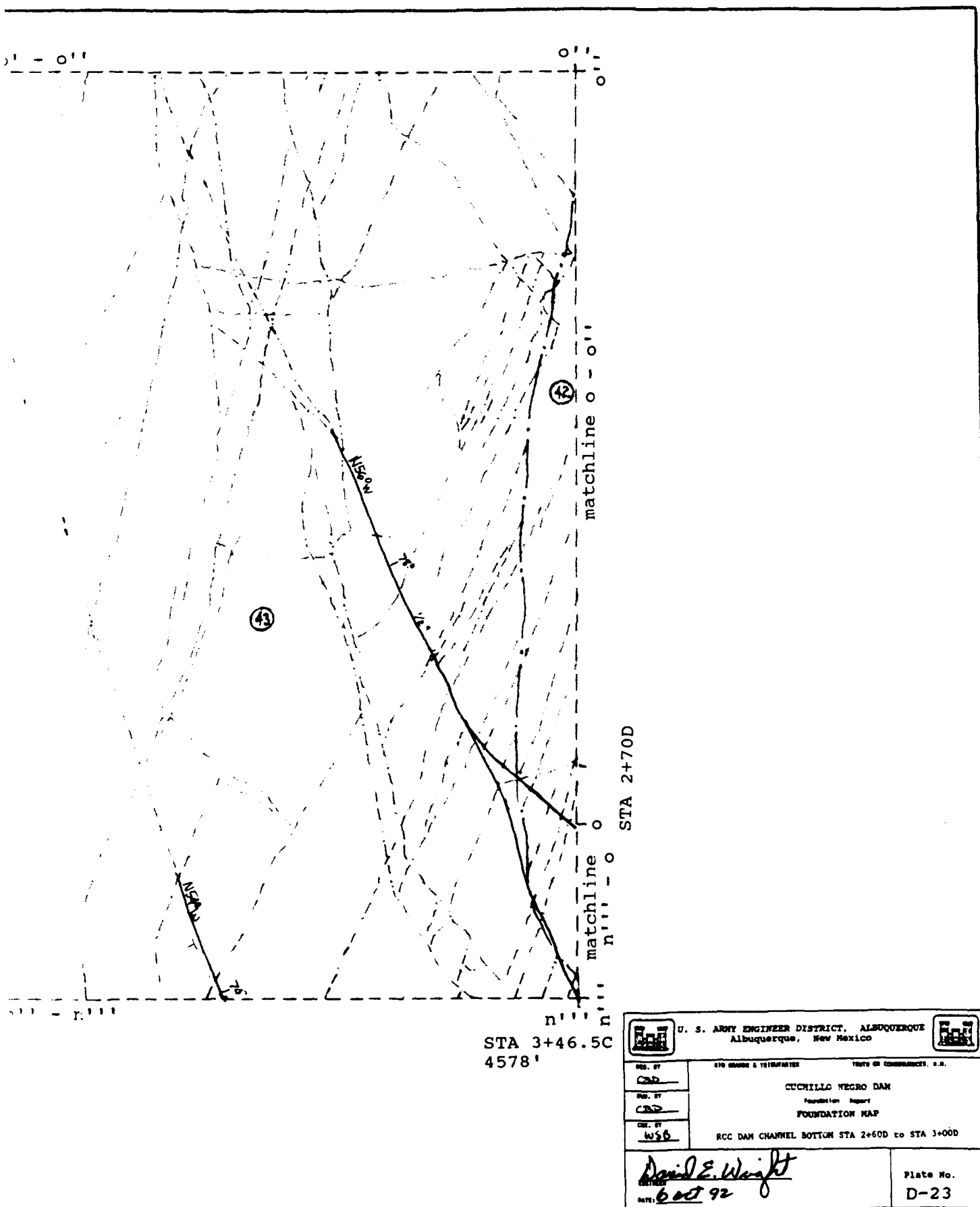
STA 2+50D



matchline n - n'''

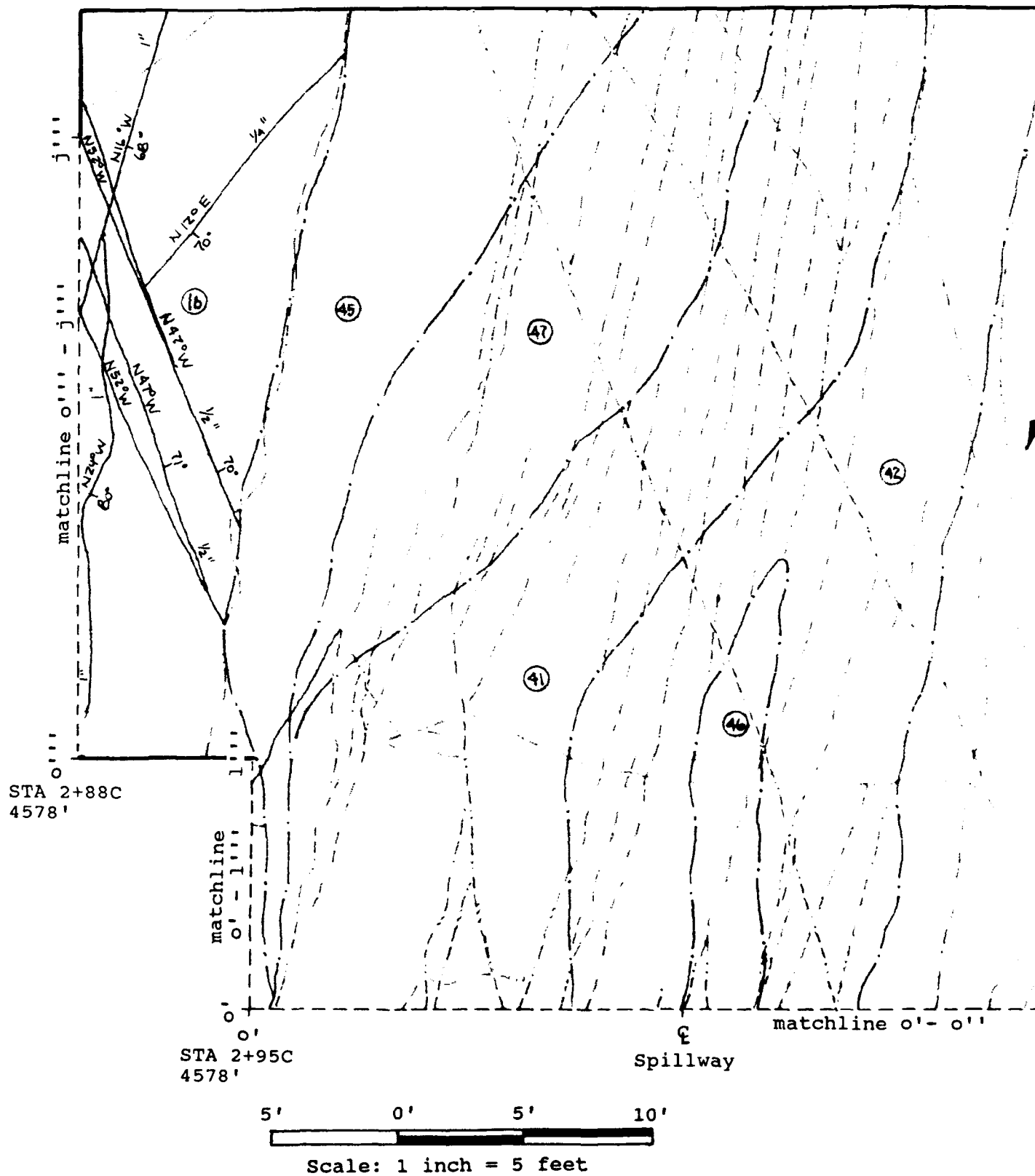
STA 3+46.5C
4578'

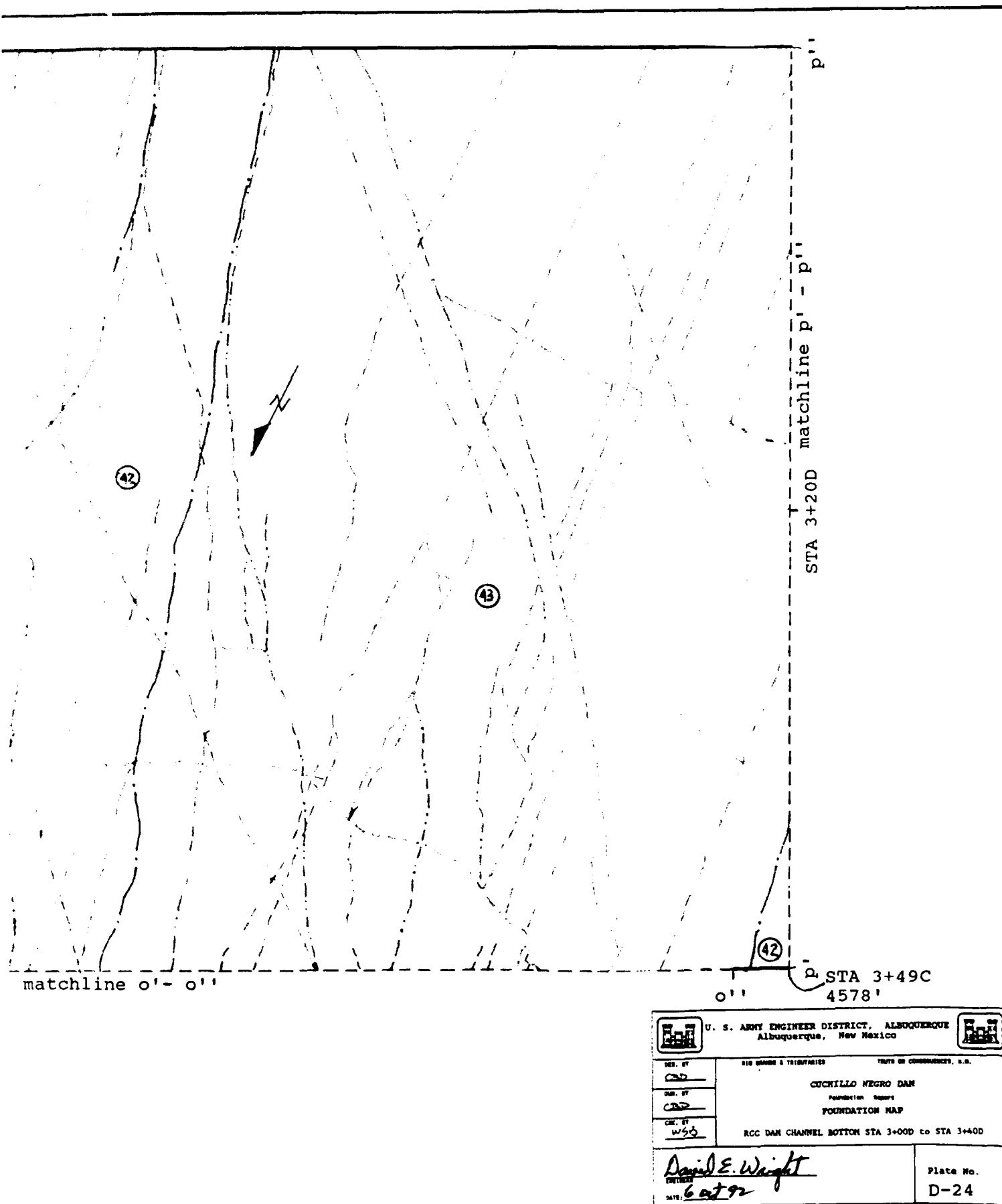
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	SITE ENGINE & TESTS/FACTS TENTS OR CONDUITS, P.A.	
DES. BY CSD	CUCHILLO NEGRO DAM Foundation Report	
DES. BY NSB	FOUNDATION MAP RCC DAM CHANNEL BOTTOM STA 2+20D to STA 2+60D	
Daniel E. Wright DATE: 6 Oct 92		Plate No. D-22





 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	SITE ENGINE & TRIANGULATION TENTS OF CONSTRUCTION, E.E.	
DES. BY <u>CSD</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <u>WSB</u>	RCC DAM CHANNEL BOTTOM STA 2+60D to STA 3+00D	
David E. Wright DATE: 6 OCT 92		Plate No. D-23

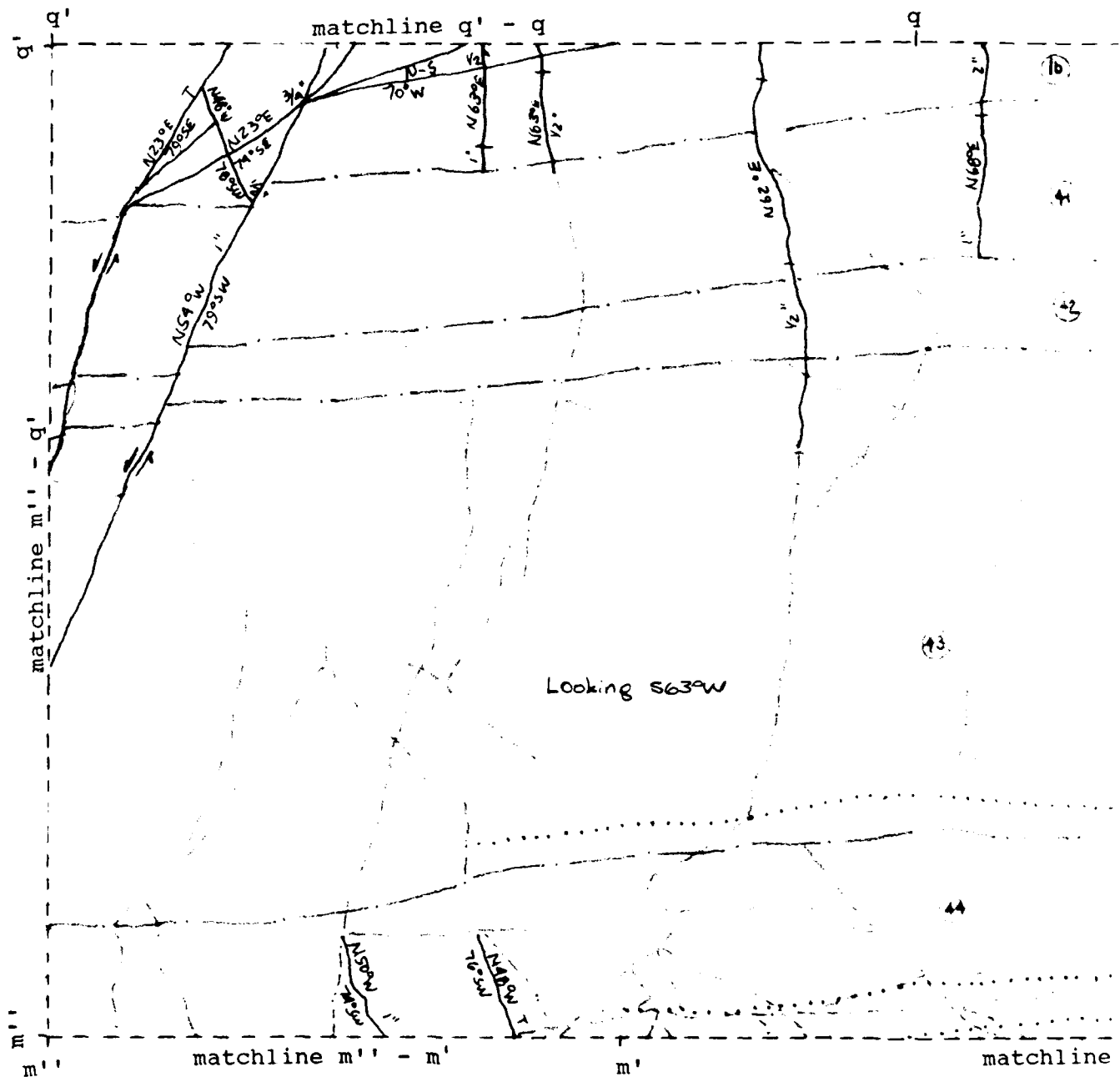




RCC DAM RIGHT ABUTMENT

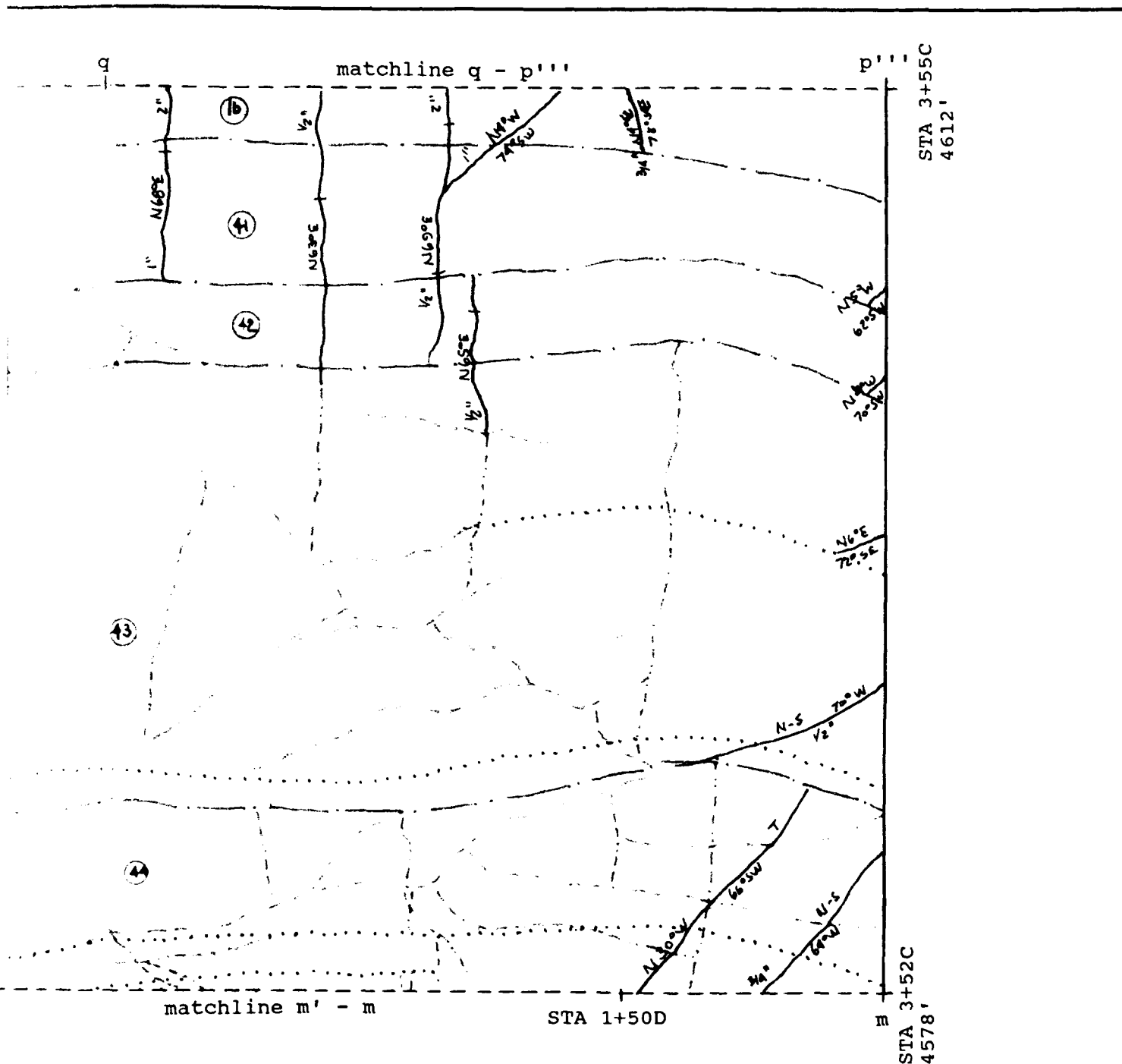
TABLE OF CONTENTS
RCC DAM RIGHT ABUTMENT



Plate No.	Title	Page No.
D-25	RCC DAM RIGHT ABUTMENT STA 3+52C to STA 3+55C.....	D-28
D-26	RCC DAM RIGHT ABUTMENT DS STA 3+52C to STA 3+55C.....	D-29
D-27	RCC DAM RIGHT ABUTMENT DS STA 3+49C to STA 3+52C.....	D-30
D-28	RCC DAM RIGHT ABUTMENT STA 3+55C to STA 3+94.5C.....	D-31
D-29	RCC DAM RIGHT ABUTMENT DS STA 3+55C to STA 3+94.5C.....	D-32
D-30	RCC DAM RIGHT ABUTMENT DS STA 3+55C to STA 3+94.5C.....	D-33
D-31	RCC DAM RIGHT ABUTMENT STA 3+94.5C to STA 4+20C.....	D-34
D-32	RCC DAM RIGHT ABUTMENT DS STA 3+94.5C to STA 4+20C.....	D-35
D-33	RCC DAM RIGHT ABUTMENT STA 4+20C to STA 4+55C.....	D-36
D-34	RCC DAM RIGHT ABUTMENT STA 4+55C to STA 5+06C.....	D-37
D-35	RCC DAM RIGHT ABUTMENT DS STA 4+55C to STA 4+97C.....	D-38
D-36	RCC DAM RIGHT ABUTMENT STA 5+06C to STA 5+70C.....	D-39
D-37	RCC DAM RIGHT ABUTMENT STA 5+70C to STA 6+35C.....	D-40



5' 0' 5' 10'

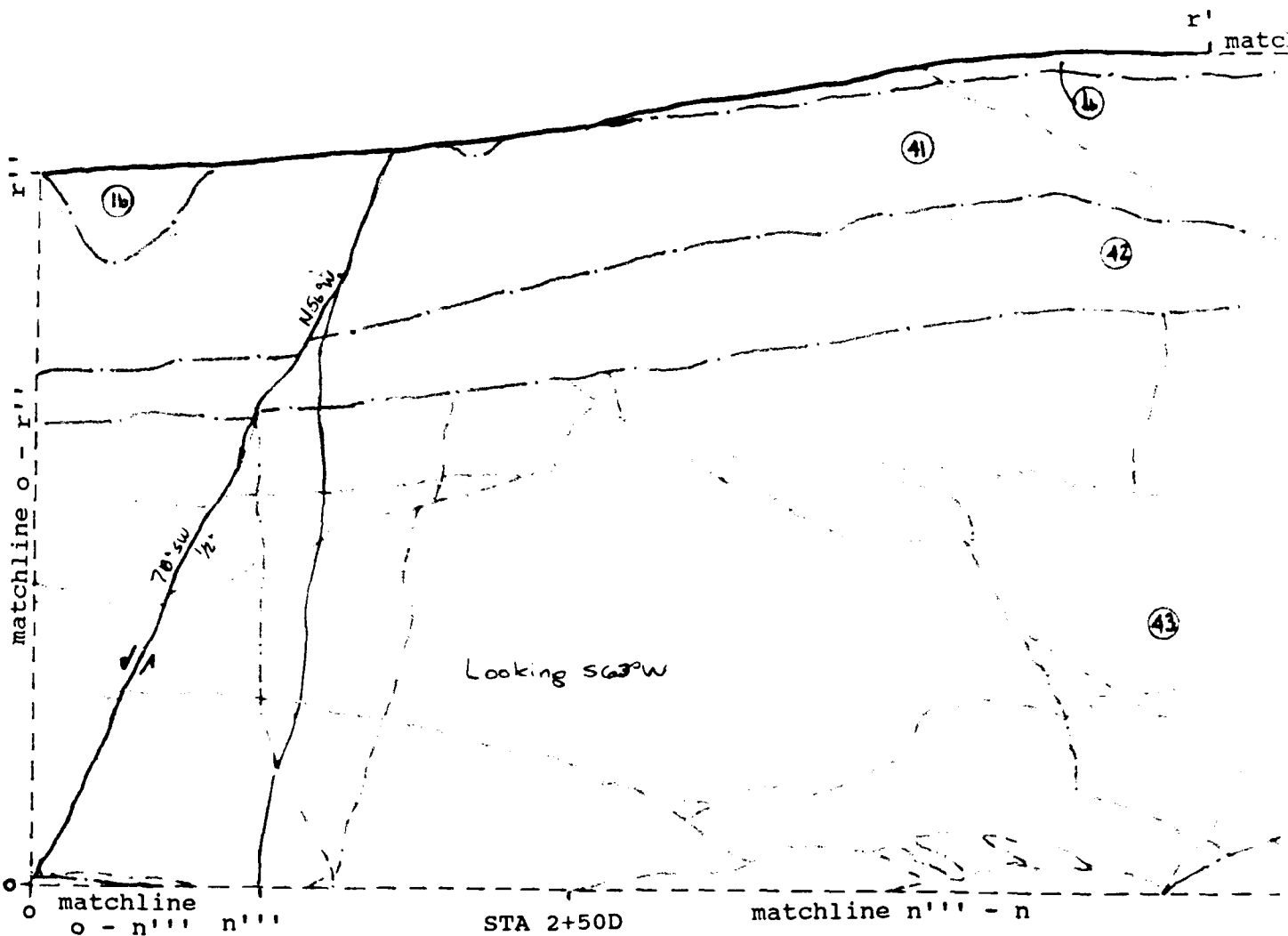
Scale: 1 inch = 5 feet



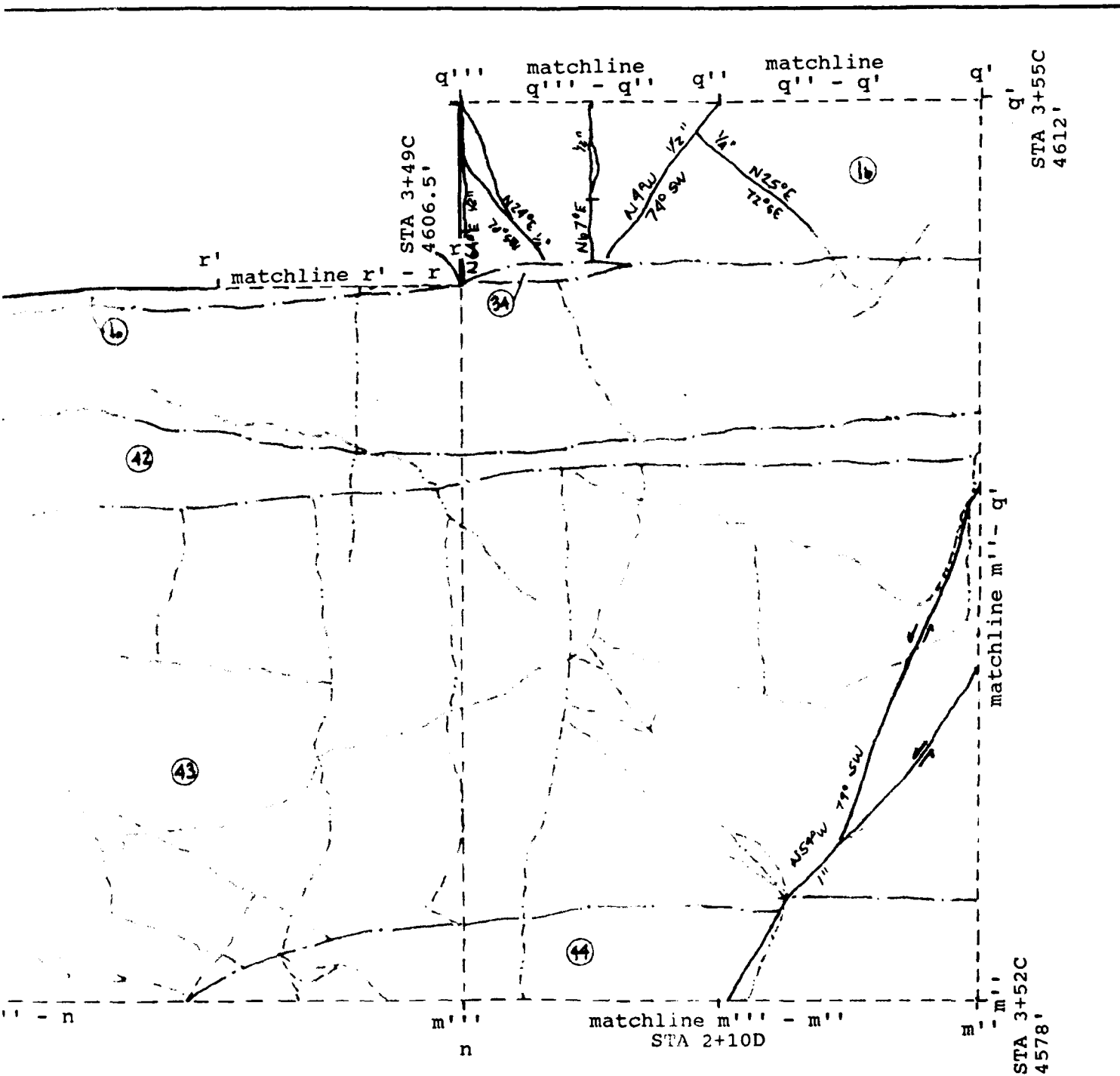
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	RIO GRANDE & TRIBUTARIES TOWN OF CHANDLER, N.M.	
DES. BY <u>CAD</u>	CUCHILLO NEGRO DAM Foundation Report	
CHK. BY <u>WSB</u>	FOUNDATION MAP RCC DAM RIGHT ABUTMENT STA 3+52C to STA 3+55C	
DATE: <u>6-2-92</u> <i>David E. Wright</i>		Plate No. D-25

STA 3+48.5C
4601.5'

STA 3+46.5C
4578'



Scale: 1 inch = 5 feet



U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	CUCILLO NEGRO DAM	
DRAWN BY CSD	Foundation Report	
CHECKED BY WSB	FOUNDATION MAP	
RCC DAM RIGHT ABUTMENT DS STA 3+52C to STA 3+55C		
DAVID E. WRIGHT DATE: 6 Oct 92		Plate No. D-26

STA 3+52C
4608'

STA 3+51.5C
4604.5'

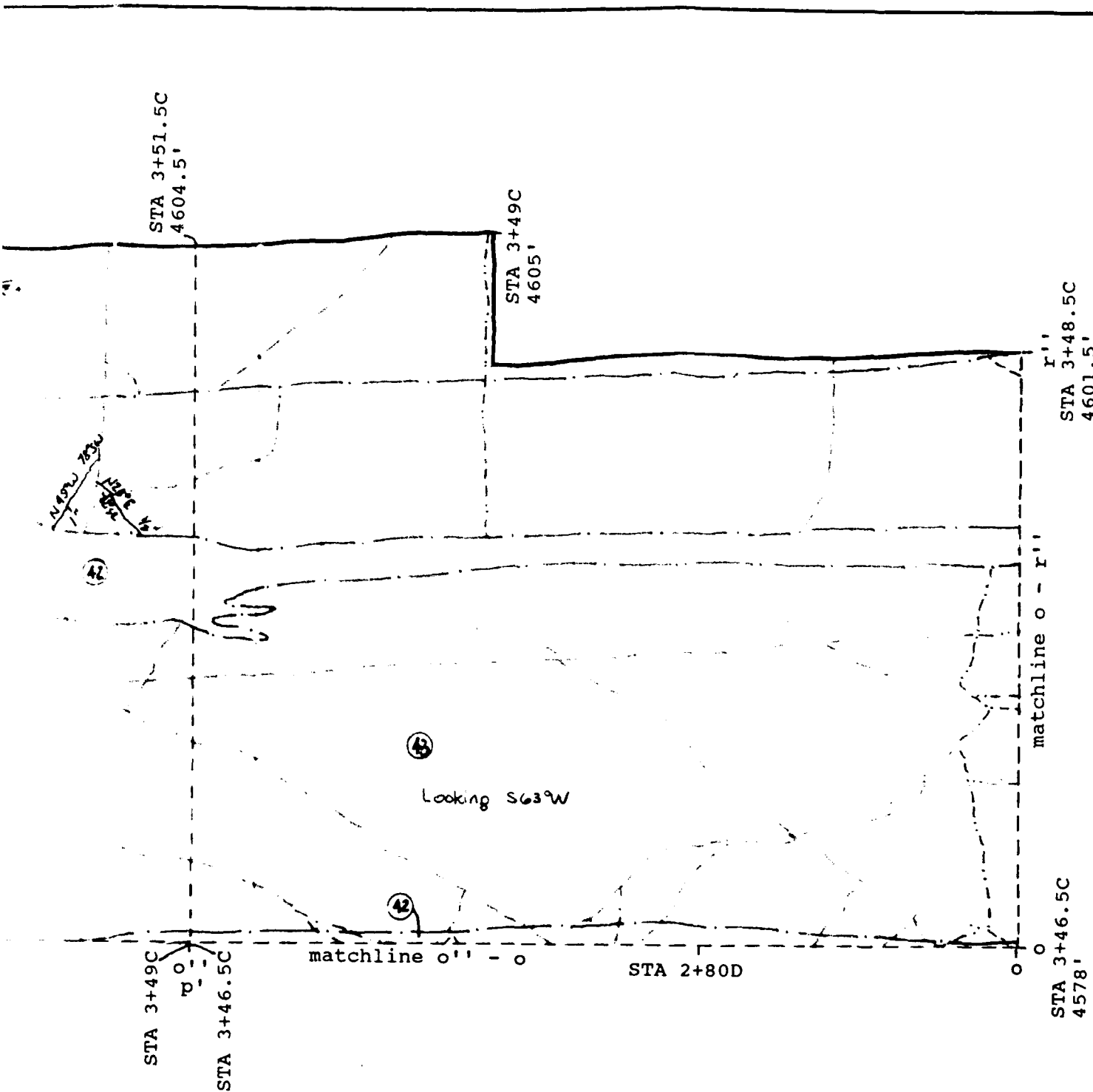
STA 3+49C
4578'



STA 3+20D matchline p'' - p'

STA 3+49C
STA 3+46.5C

5' 0' 5' 10'

Scale: 1 inch = 5 feet

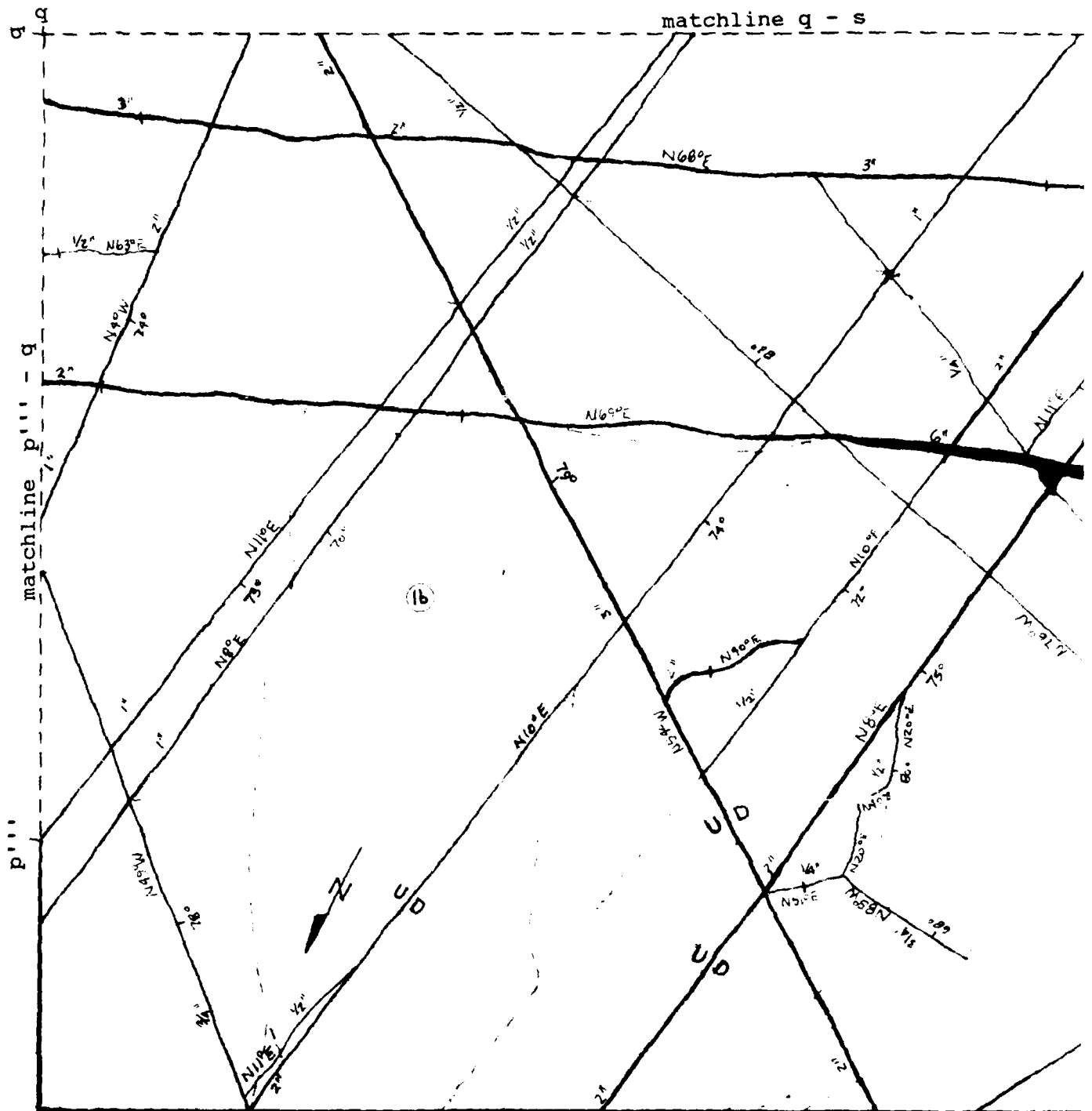


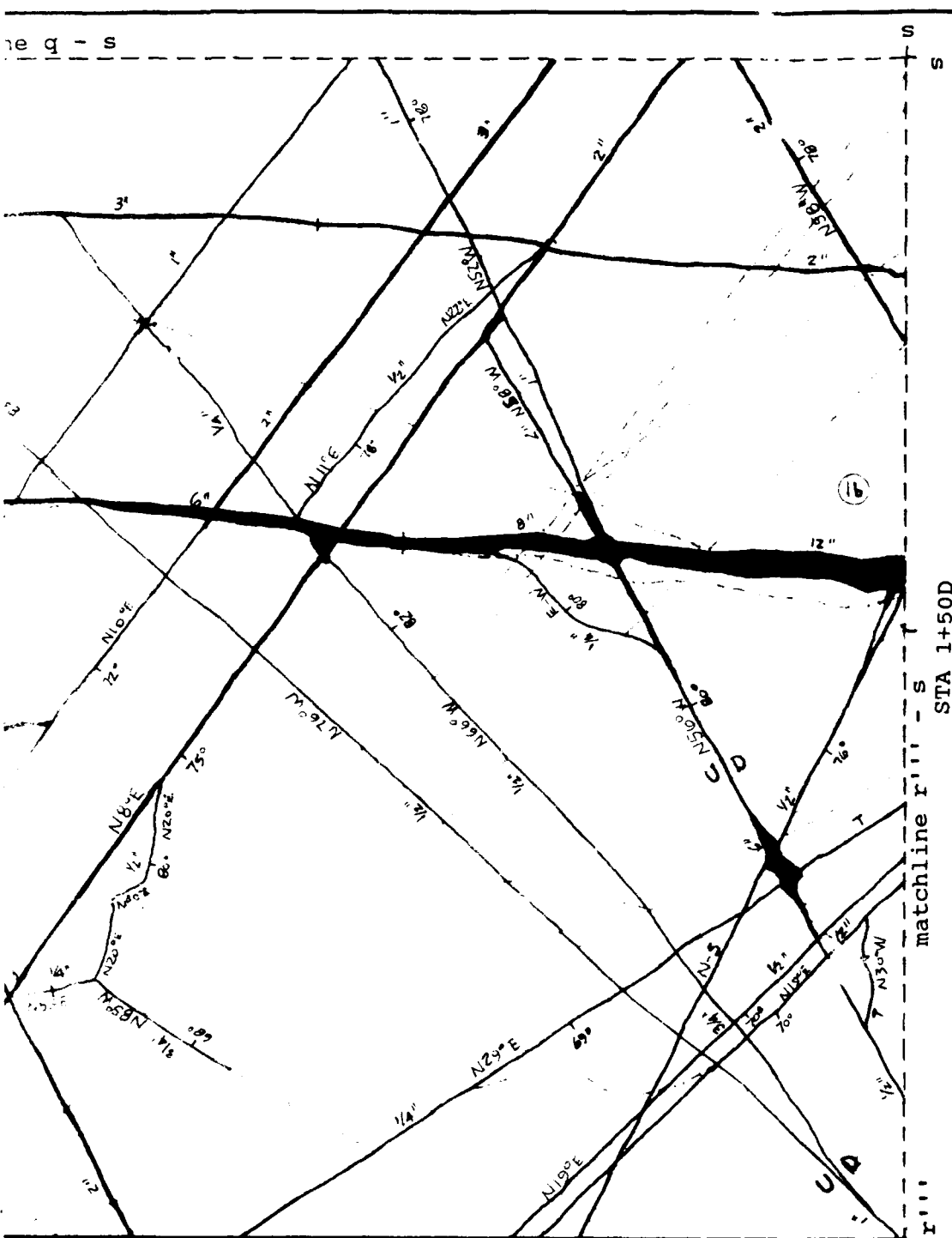
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	RTO CHARGE & TEST/ANALYSIS TOWNSHIP OF CHANDLER, N.M.	
MD. BY <u>CSD</u>	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <u>WSB</u>	RCC DAM RIGHT ABUTMENT DS STA 3+49C to STA 3+52C	
DATE: <u>6 Oct 92</u> <i>David E. Wright</i>		Plate No. D-27



STA 3+55C
4612'

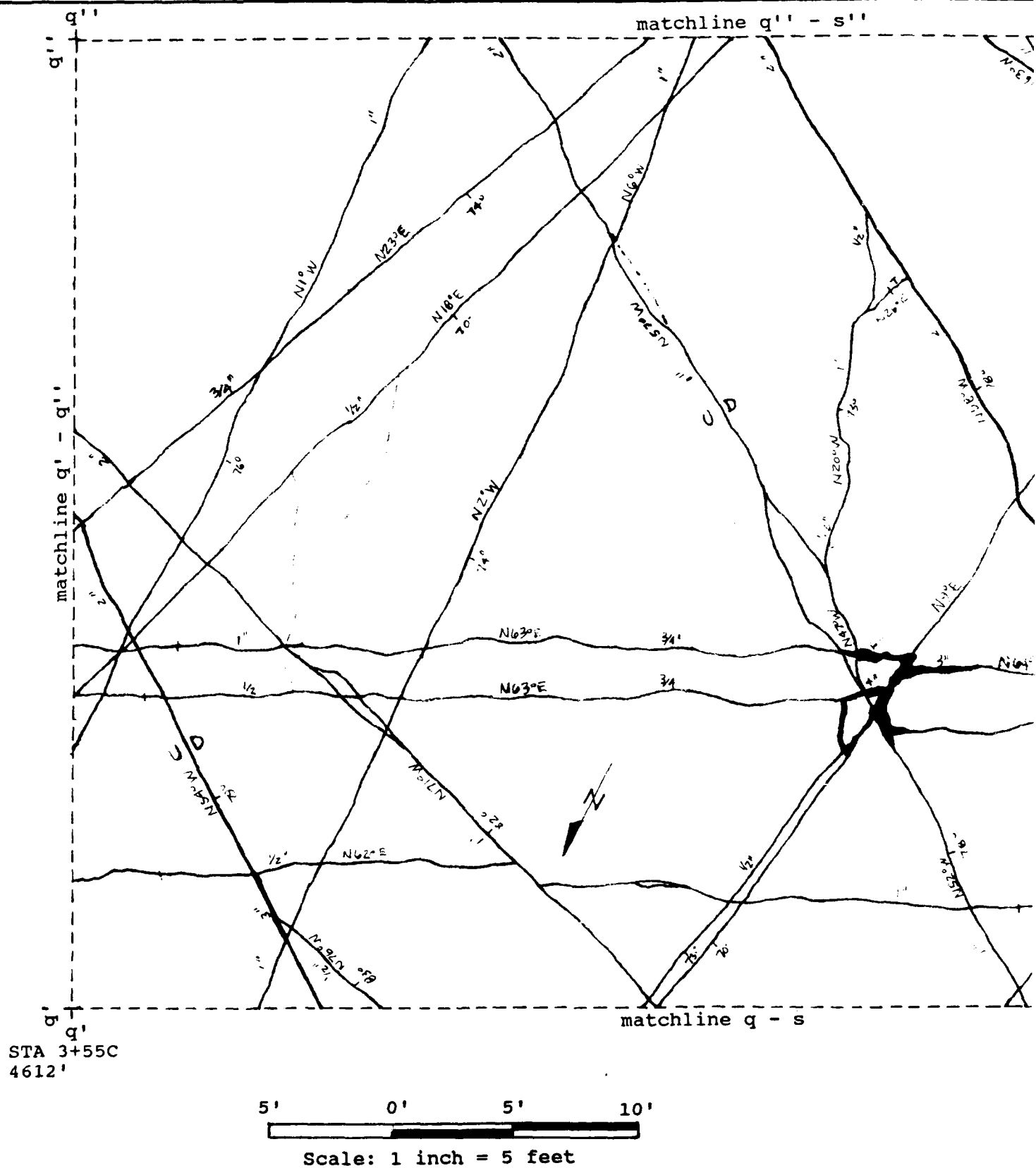
5' 0' 5' 10'

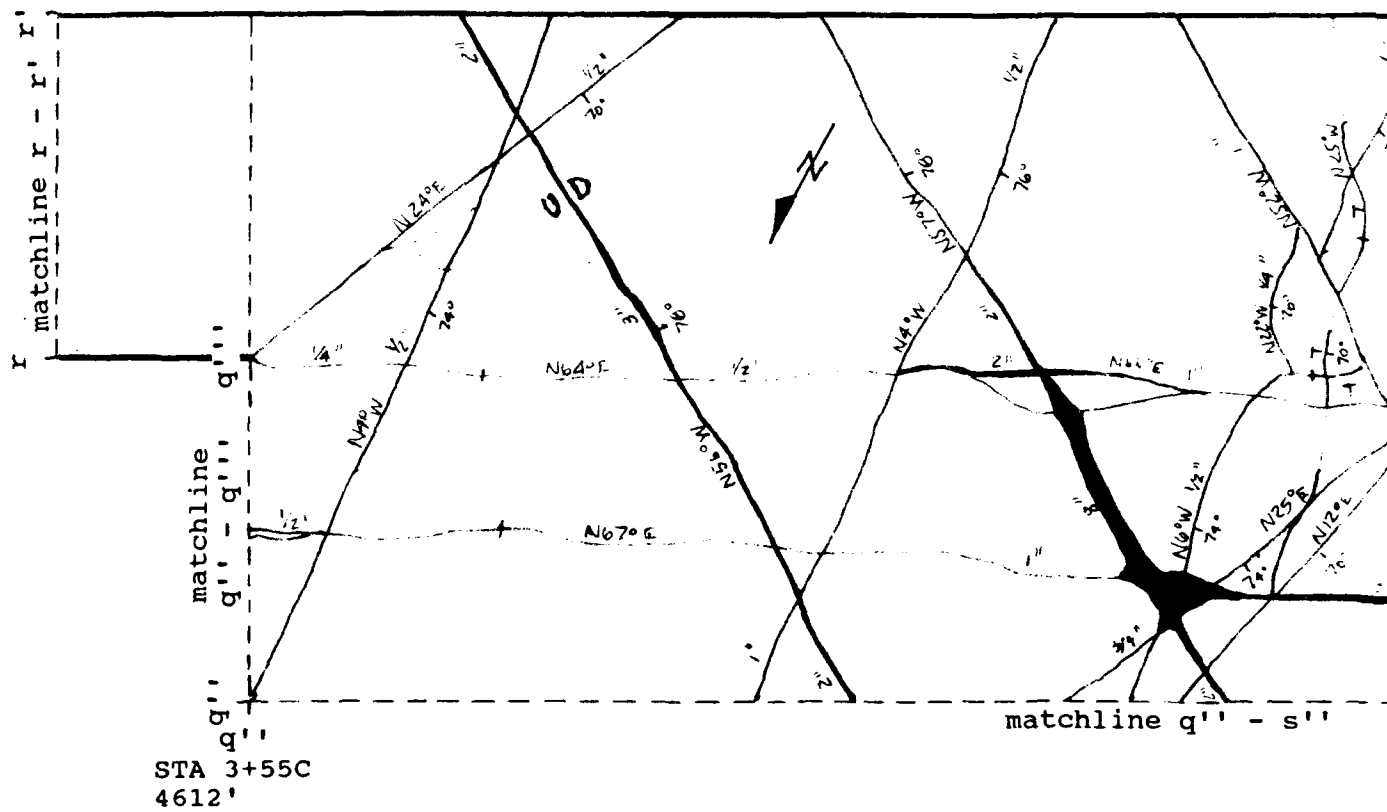
Scale: 1 inch = 5 feet





	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CBD</u>	BYD GRADING & TRAILWAYS		PLATE OR CORRESPONDENCE, U.S.
DES. BY <u>CBD</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP		
CHK. BY <u>WJS</u>	RCC DAM RIGHT ABUTMENT STA 3+55C to STA 3+94.5C		
DATE: <u>Oct 92</u> <i>David E. Wright</i>		Plate No. D-28	





STA 3+94.5C
4654'

r - r'

matchline r' - s

S

STA 4+20C
4670'

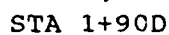
t

STA 1+50D

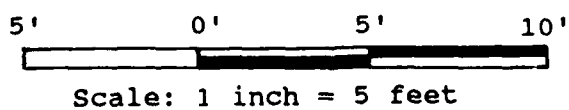
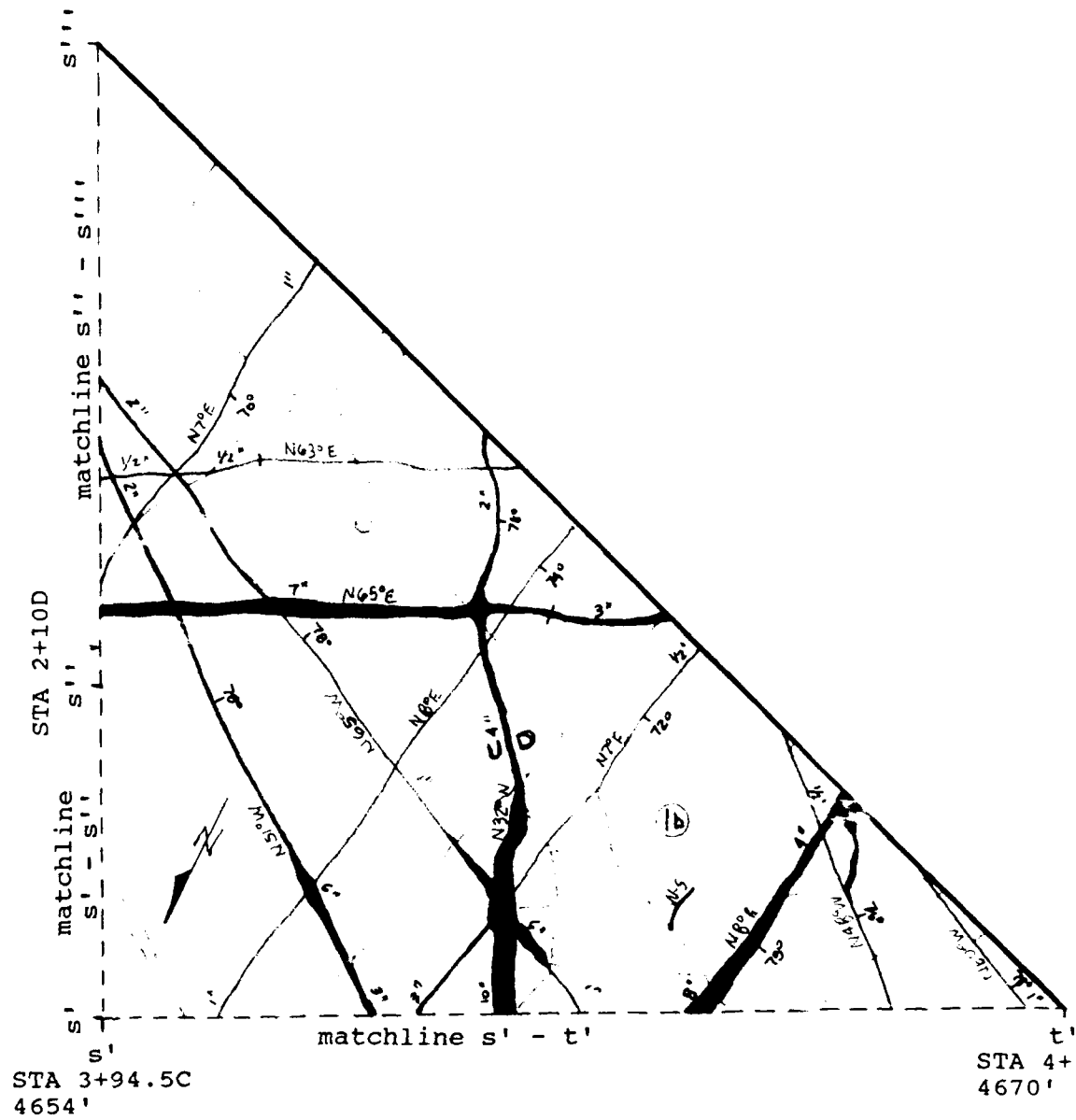
matchline t - t'

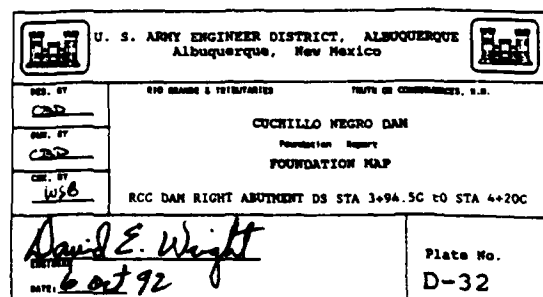


Scale: 1 inch = 5 feet

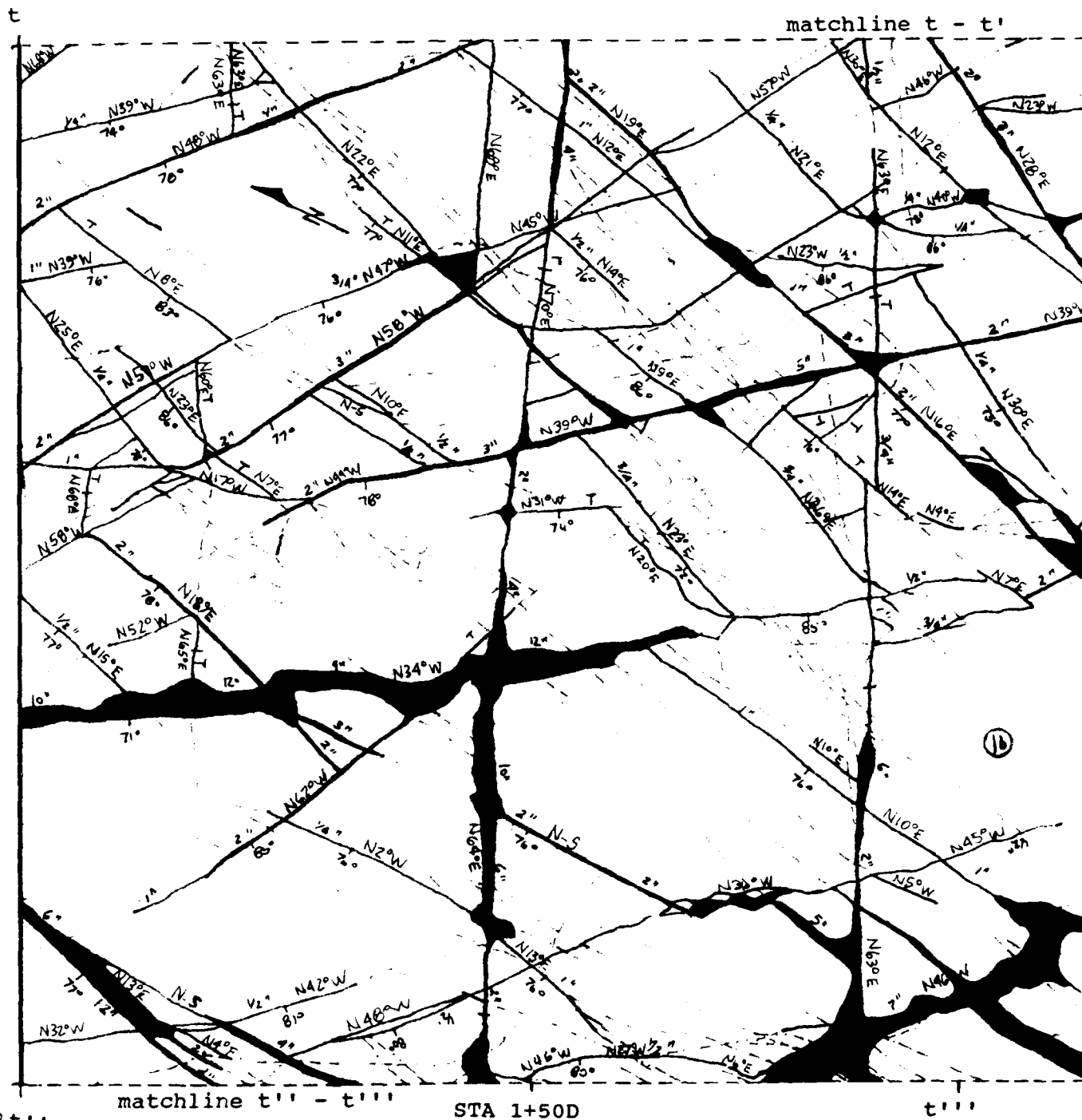


D-34





STA 4+55C
4686'

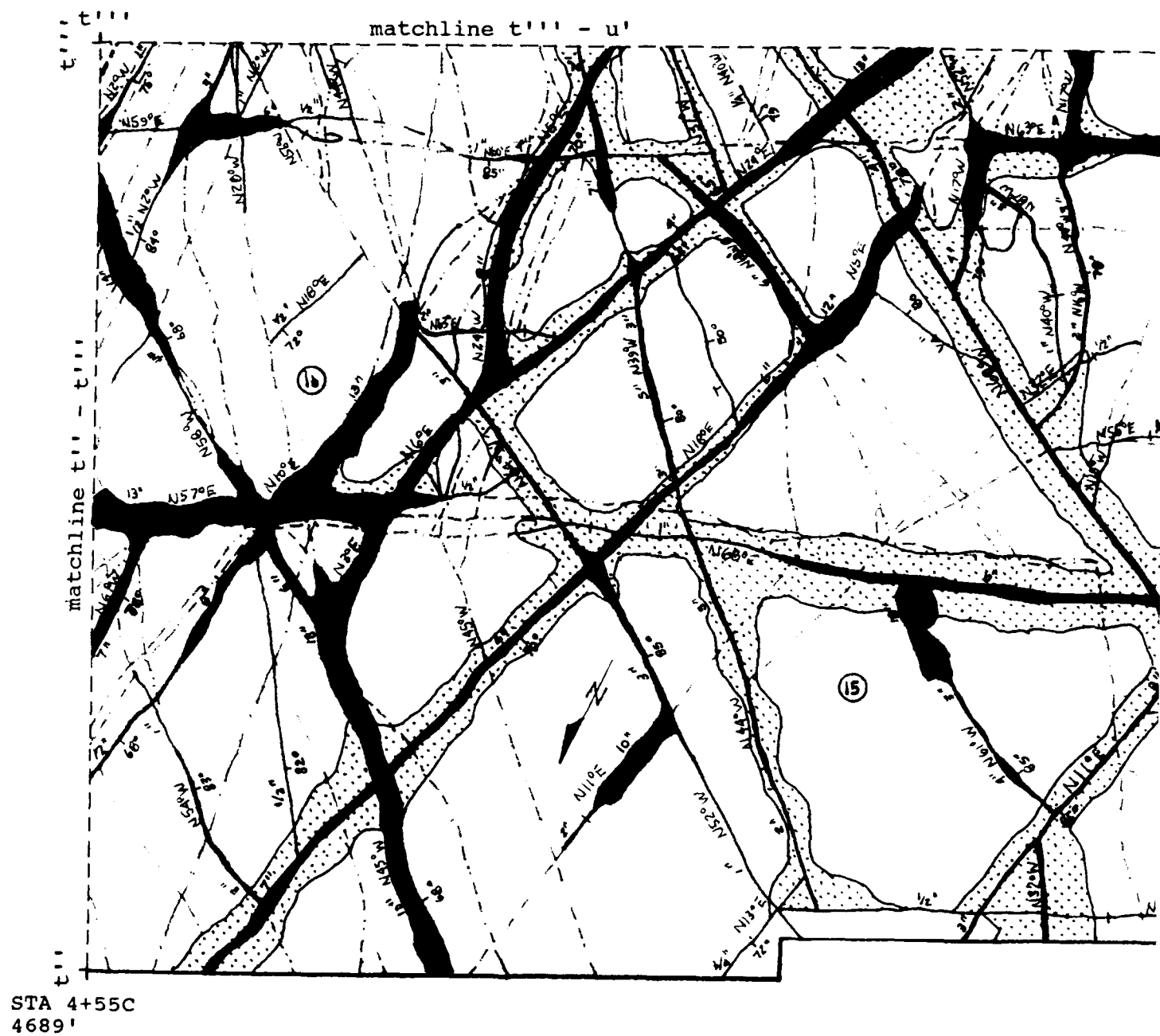


5' 0' 5' 10'

Scale: 1 inch = 5 feet

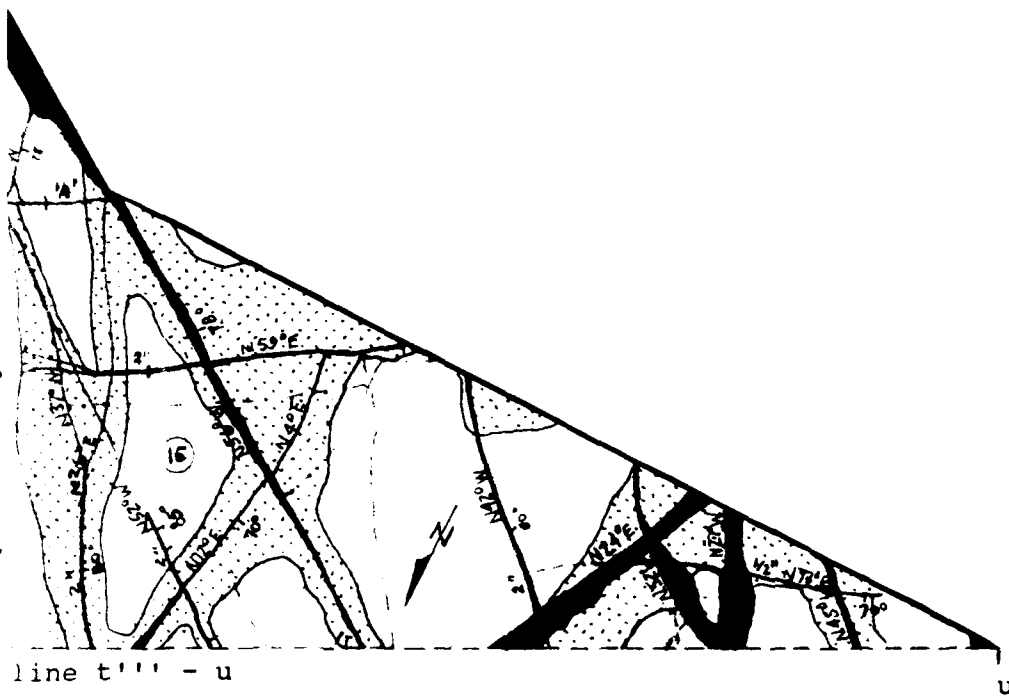
t.







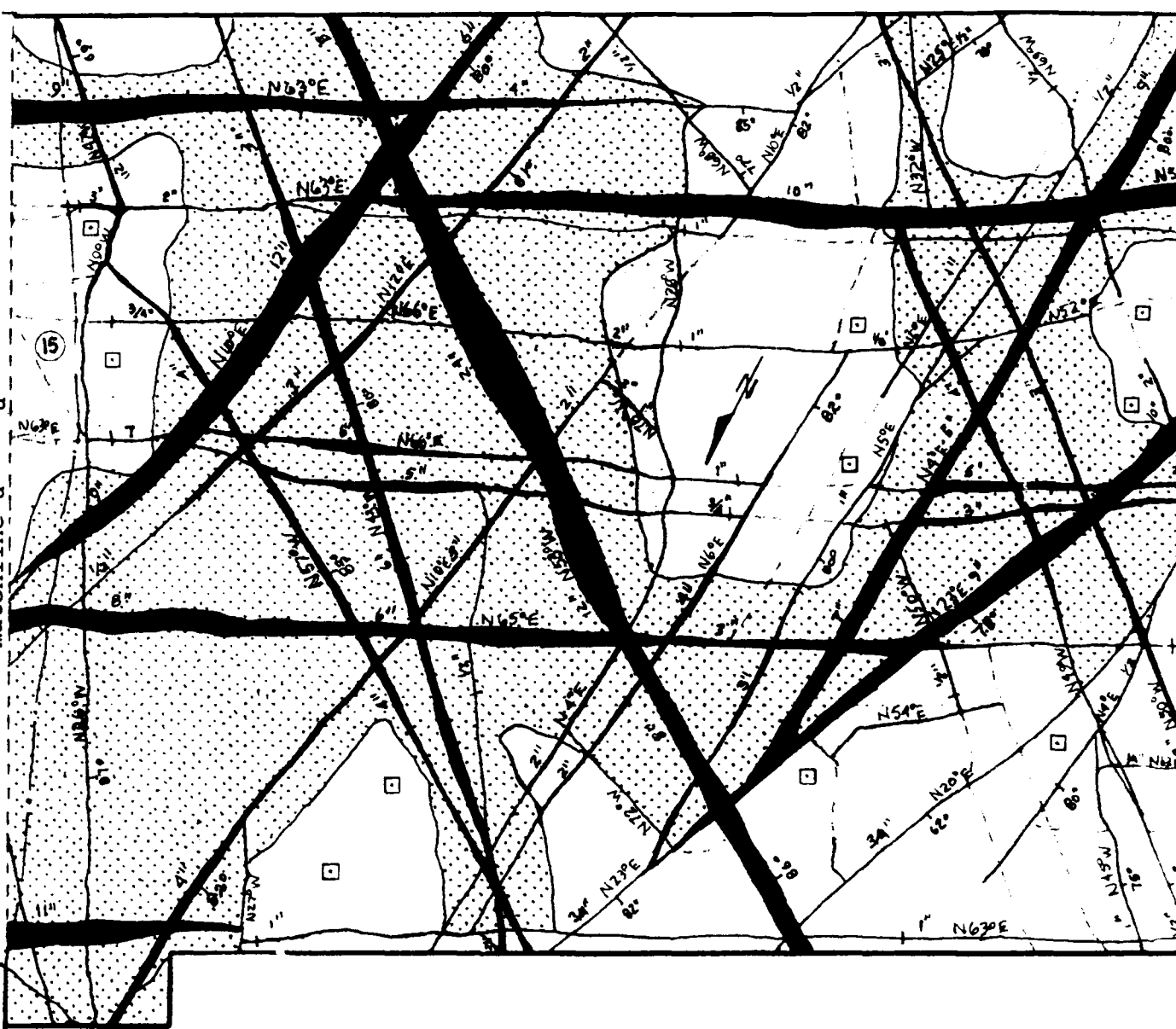
5' 0' 5' 10'

Scale: 1 inch = 5 feet

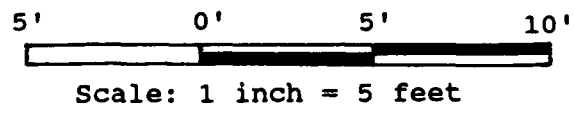


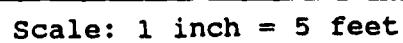
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <i>CAD</i>	610 GRAND & TRINITY AVENUE TRUTH OR CONSCIENCE, N.M.	
DES. BY <i>CAD</i>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <i>W58</i>	RCC DAM RIGHT ABUTMENT DS STA 4+55C to STA 4+97C	
<i>David E. Wright</i> DATE: <i>6 Oct 92</i>		Plate No. D-35

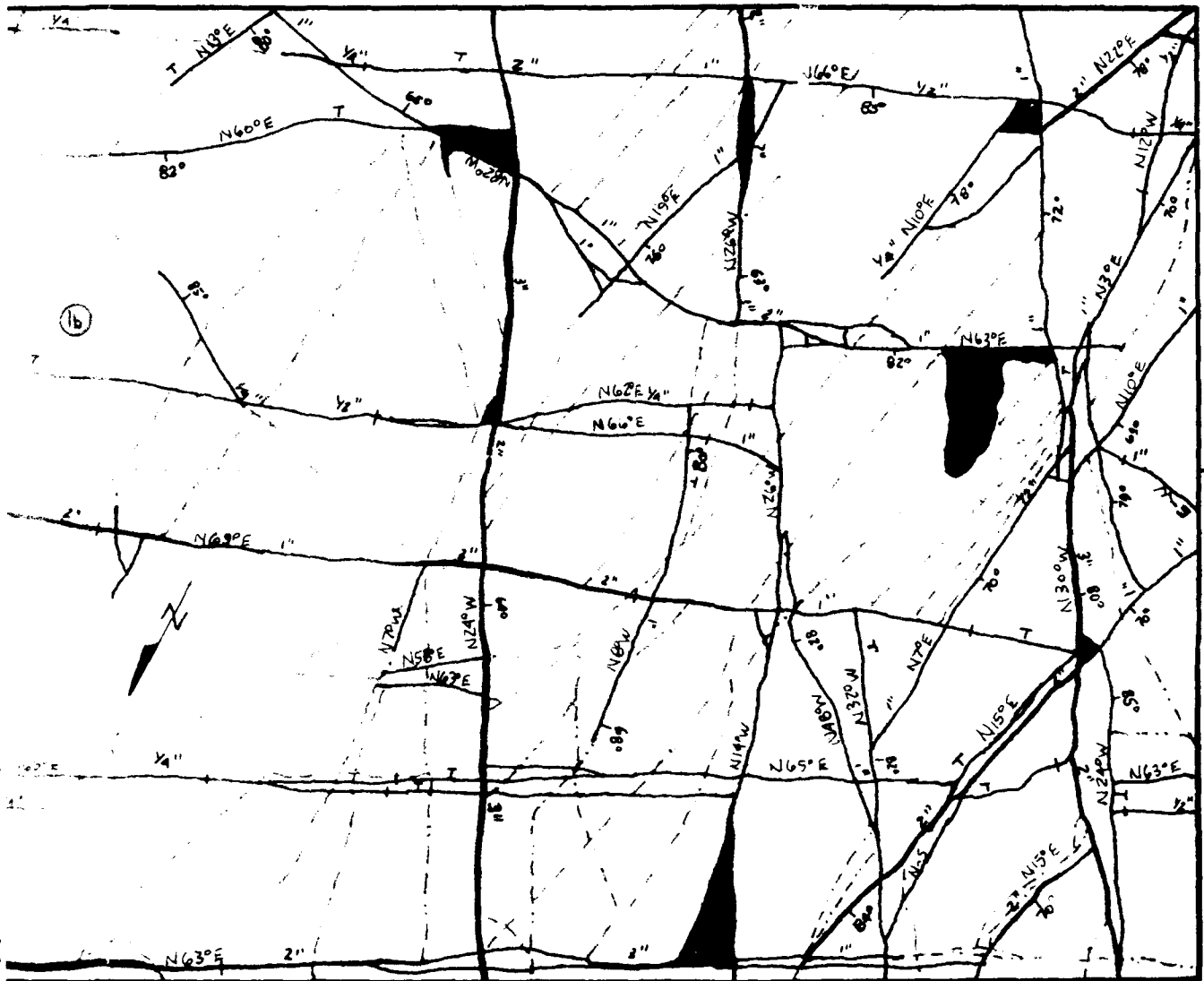
matchline u'' - u'''



STA 5+06C
4712'












STA 1+50D

STA 6+35C
4732'

 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY 	SIO NUMBER & TRIBUTARIES TRUTH OR CONSEQUENCE, N.H.	
DED. BY 	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
COR. BY 	RCC DAM RIGHT ABUTMENT STA 5+70C to STA 6+35C	
Daniel E. Wright DATE: 6 Oct 92		Plate No. D-37

AUXILIARY SPILLWAY LEFT SIDE

TABLE OF CONTENTS
AUXILIARY SPILLWAY LEFT SIDE

Plate No.	Title	Page No.
D-38	AUXILIARY SPILLWAY LEFT SIDE Sill-20 to Sill+20.....	D-42
D-39	AUXILIARY SPILLWAY LEFT SIDE STA 1+36S to STA 1+73.5S.....	D-43
D-40	AUXILIARY SPILLWAY LEFT SIDE STA 1+73.5S to STA 2+10S.....	D-44
D-41	AUXILIARY SPILLWAY LEFT SIDE STA 2+10S to STA 2+11S.....	D-45
D-42	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.5S to STA 2+10S....	D-46
D-43	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+41S to STA 1+92.5S....	D-47
D-44	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+62.5S to STA 2+10S....	D-48
D-45	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.5S to STA 2+10S....	D-49
D-46	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+41S to STA 1+92.5S....	D-50
D-47	AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.5S to STA 2+35.5S..	D-51

4743.5'

STA 1+36S
4708'

aa

5'

0'

5'

10'

sill

matchline aa - aa'

Scale: 1 inch = 5 feet

(24)

(49)

(24)

(21)

(40)

(78)

(17)

(78)

(18)

(17)

Looking N 76° E

(20)

(22)

(17)

N 17° W
80° NE

N 17° W
80° NE

N 17° W
80° NE

2" N 58° W
78° SW

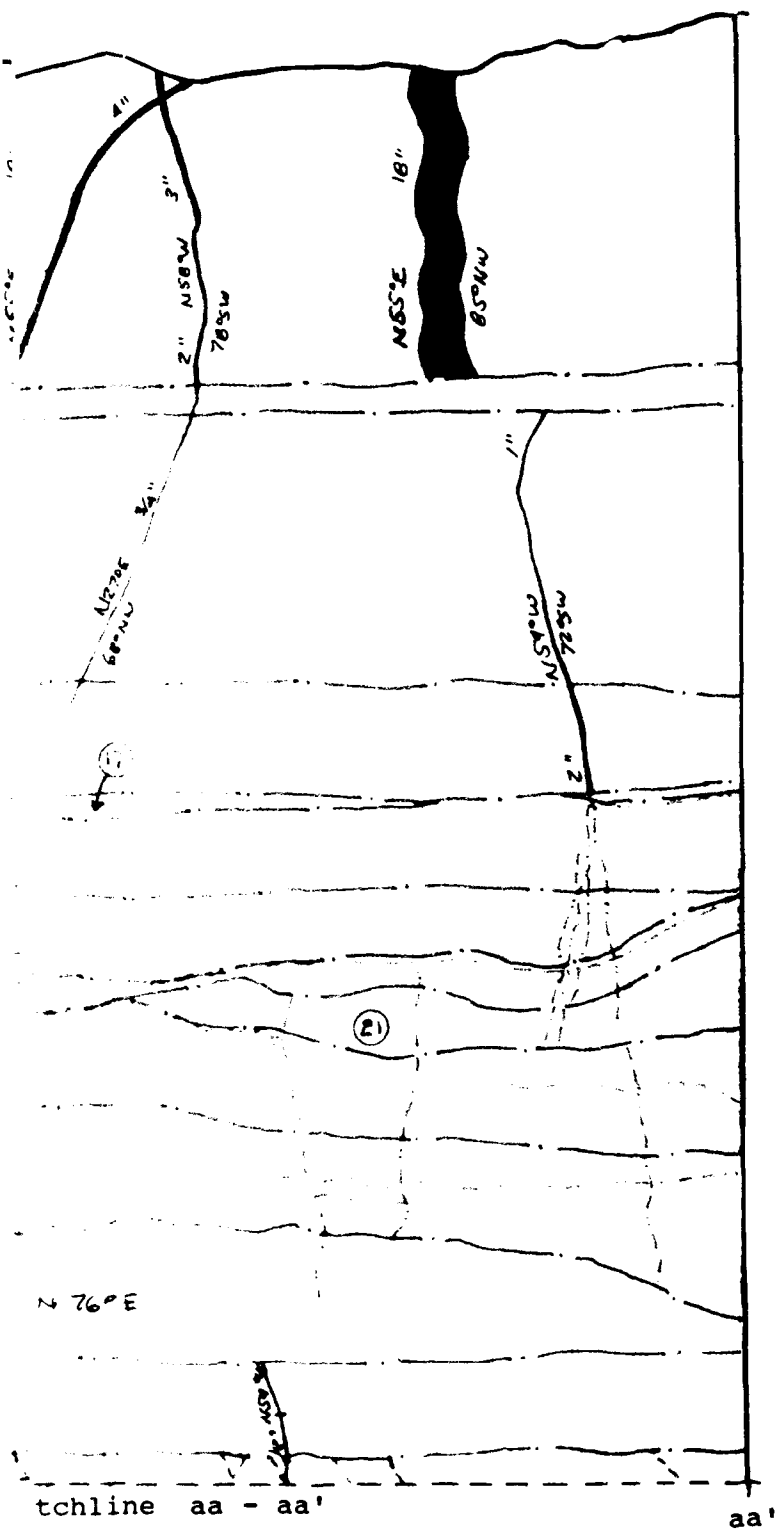
4"



3"

78° SW

N 17° W
80° NE

4749.



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	RIO GRANDE & TRIBUTARIES	
DIB. BY <u>CAD</u>	TRUTH OR CONSEQUENCE, N.M.	
CHK. BY <u>W.S.B.</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
AUXILIARY SPILLWAY LEFT SIDE S111-20 to STA S111+20		
Daniel E. Wright DATE: <u>6 Oct 92</u>		Plate No. D-38

aa

aa

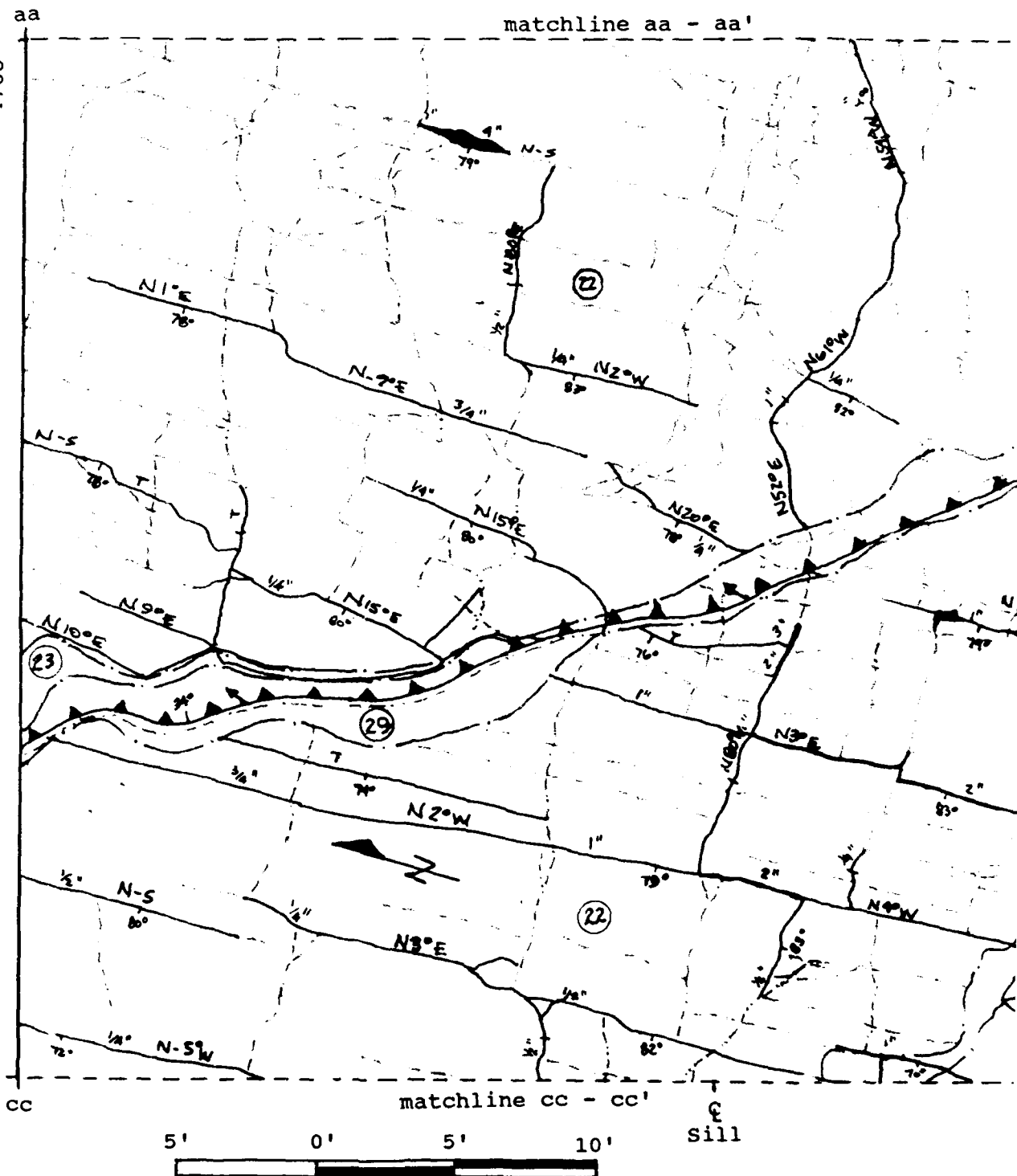
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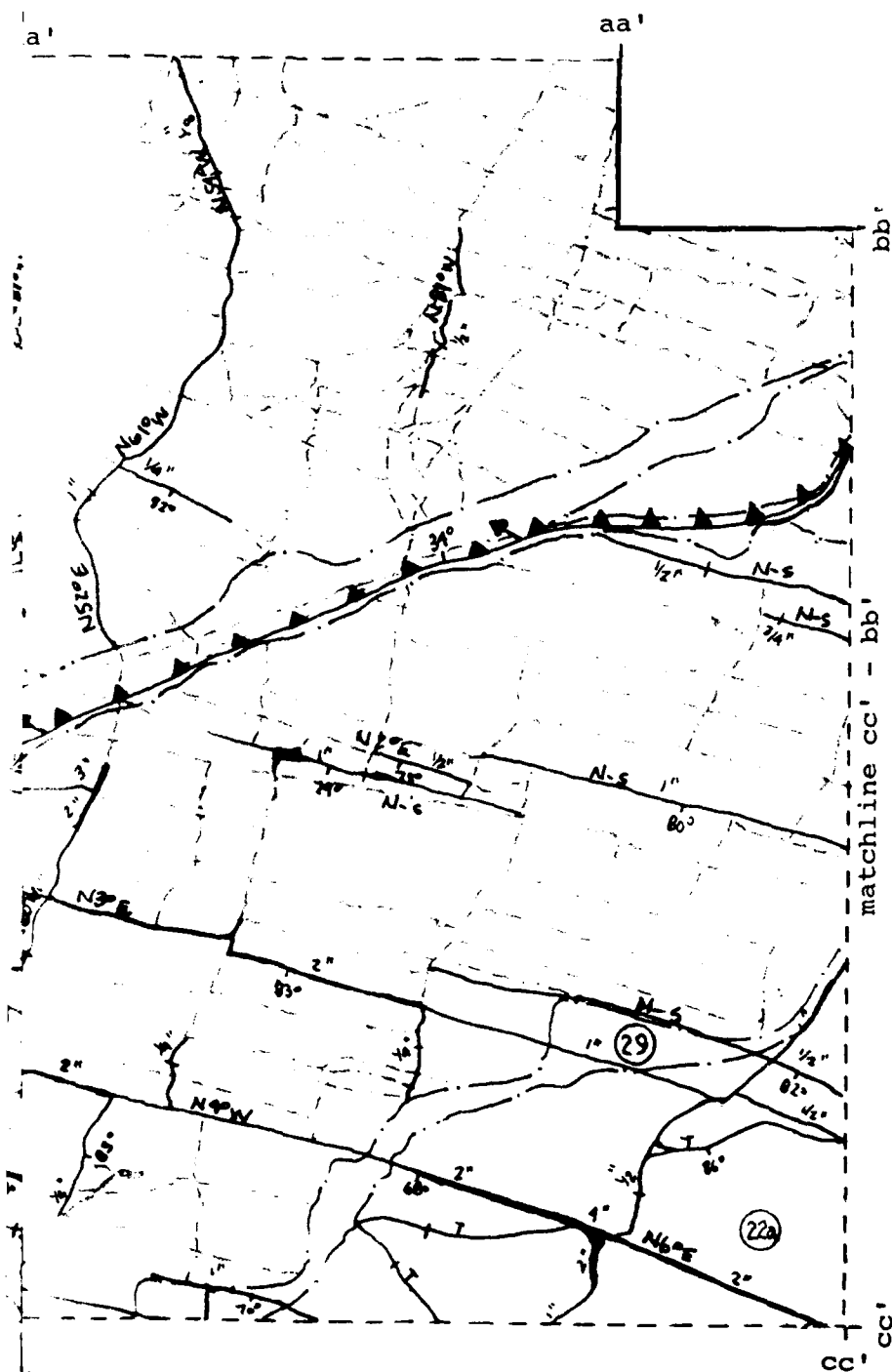
CC



CC

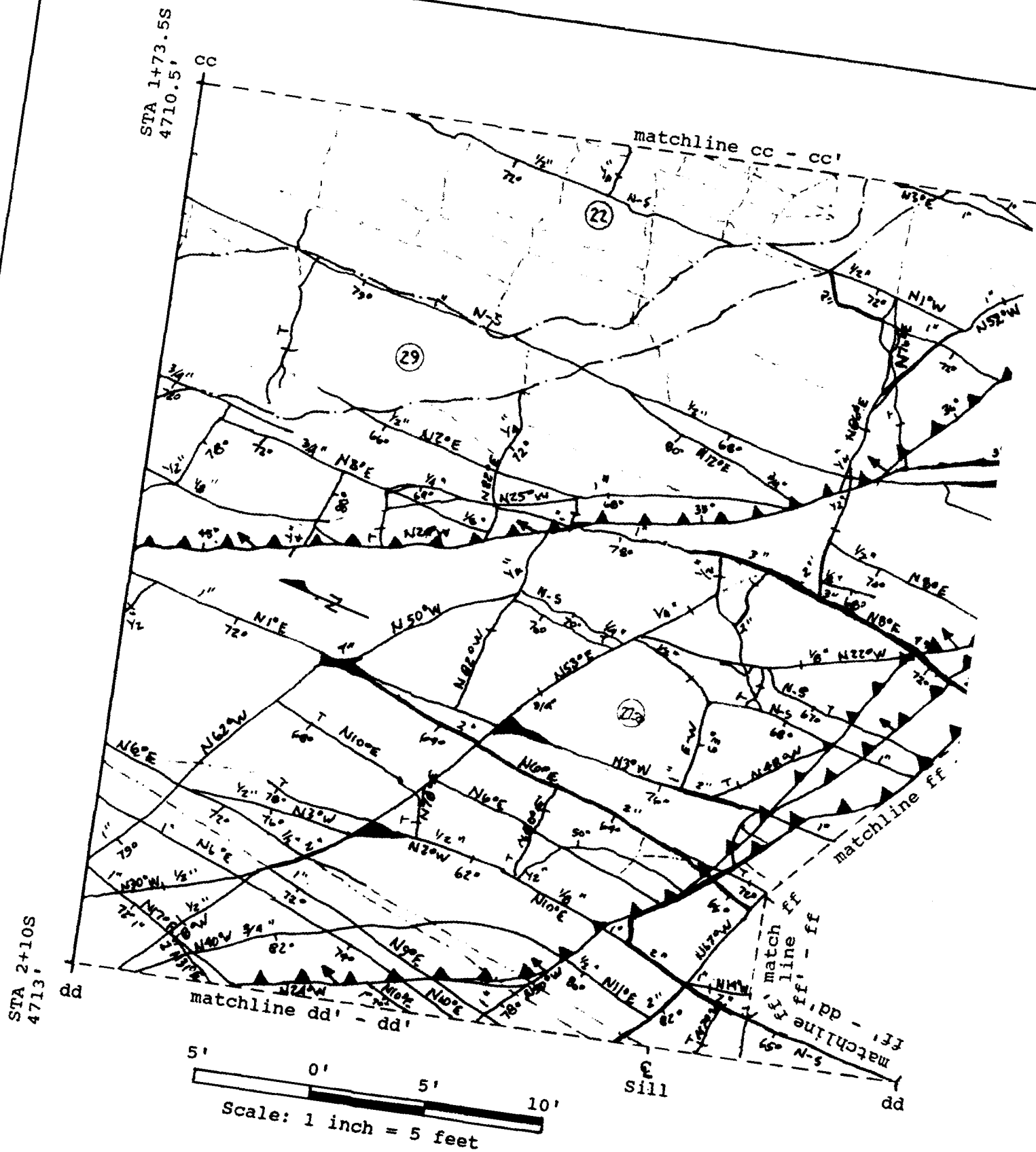
CC

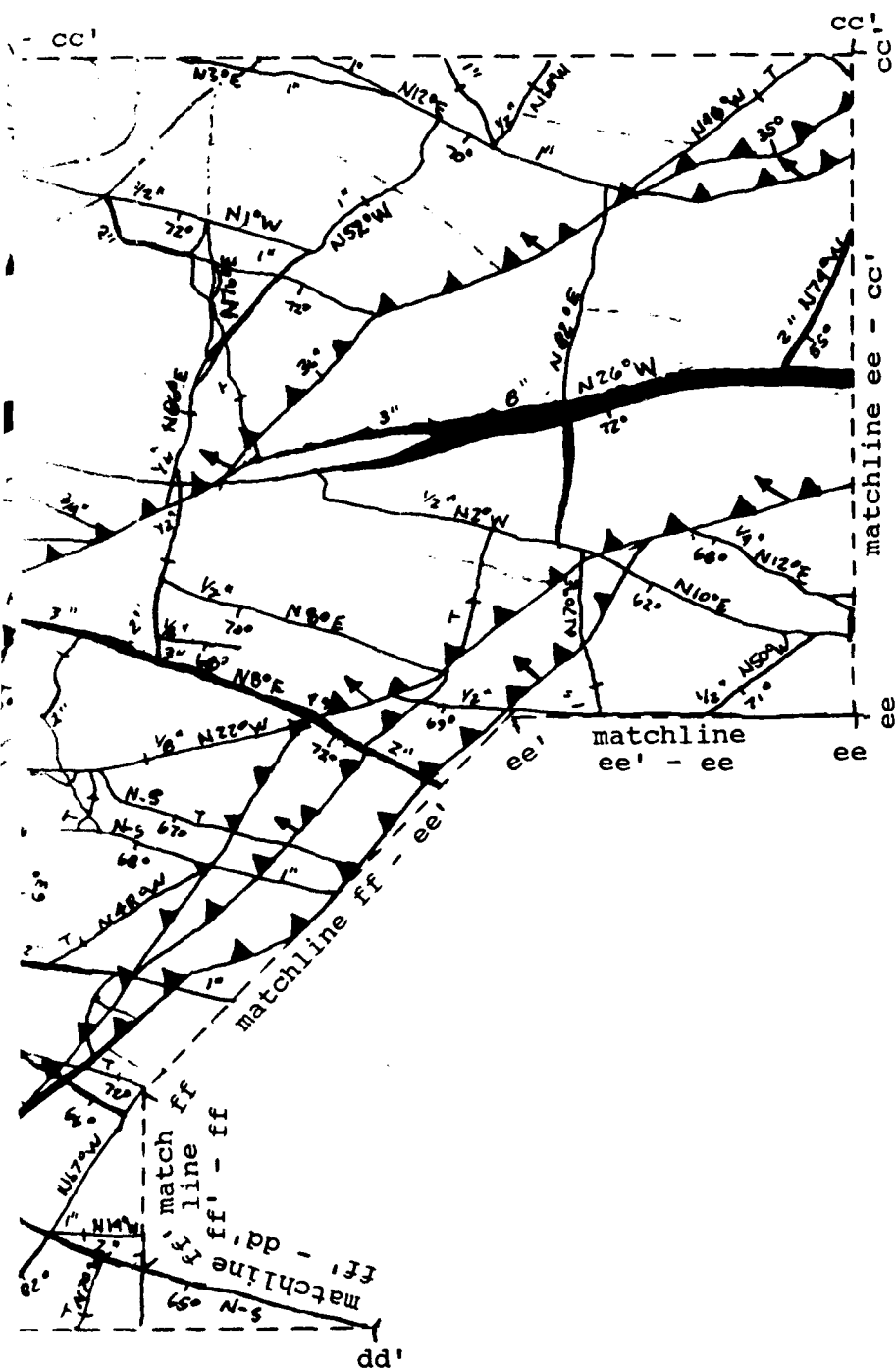
CC



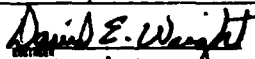


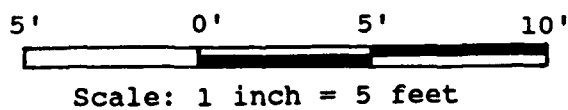
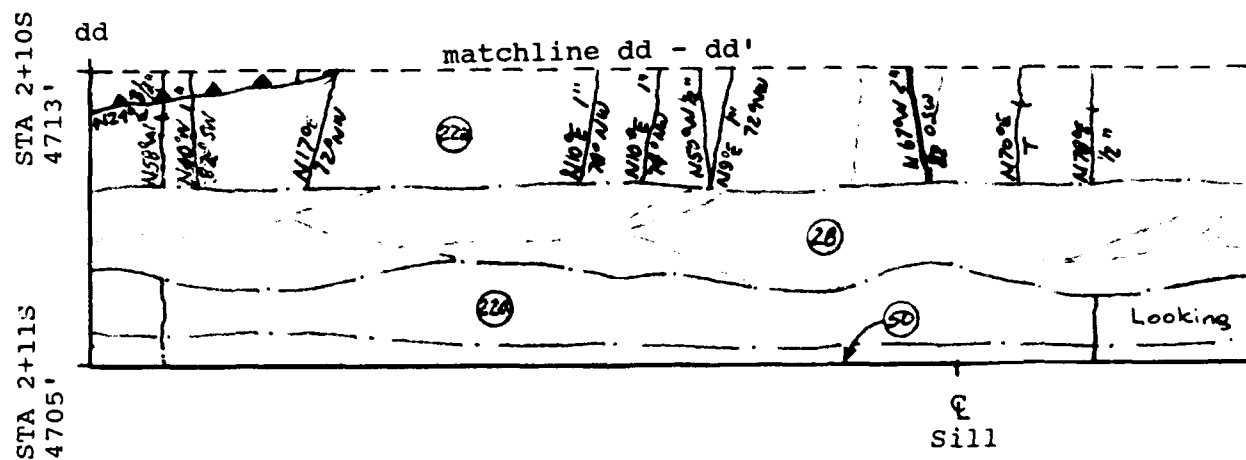


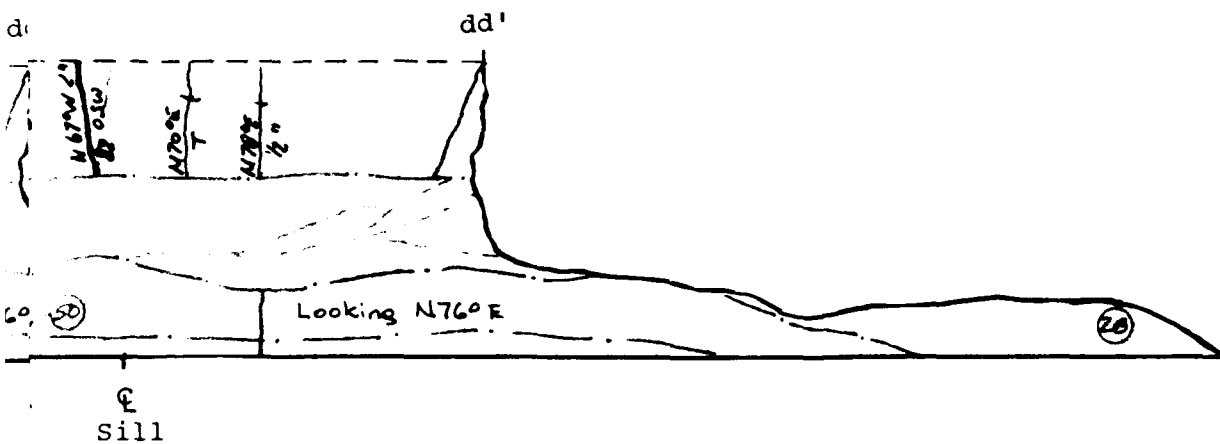
	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
REV. BY <u>CND</u>	210 GRADES & TRIESTARIES	TITLE OR COMMISSION, E.S.	
DES. BY <u>CND</u>		CUCHILLO NEGRO DAM	
COR. BY <u>WSB</u>		Foundation Support FOUNDATION MAP	
		AUXILIARY SPILLWAY LEFT SIDE STA 1+365 to STA 1+73.55	
David E. Wright DATE: <u>6 Oct 92</u>		Plate No. D-39	





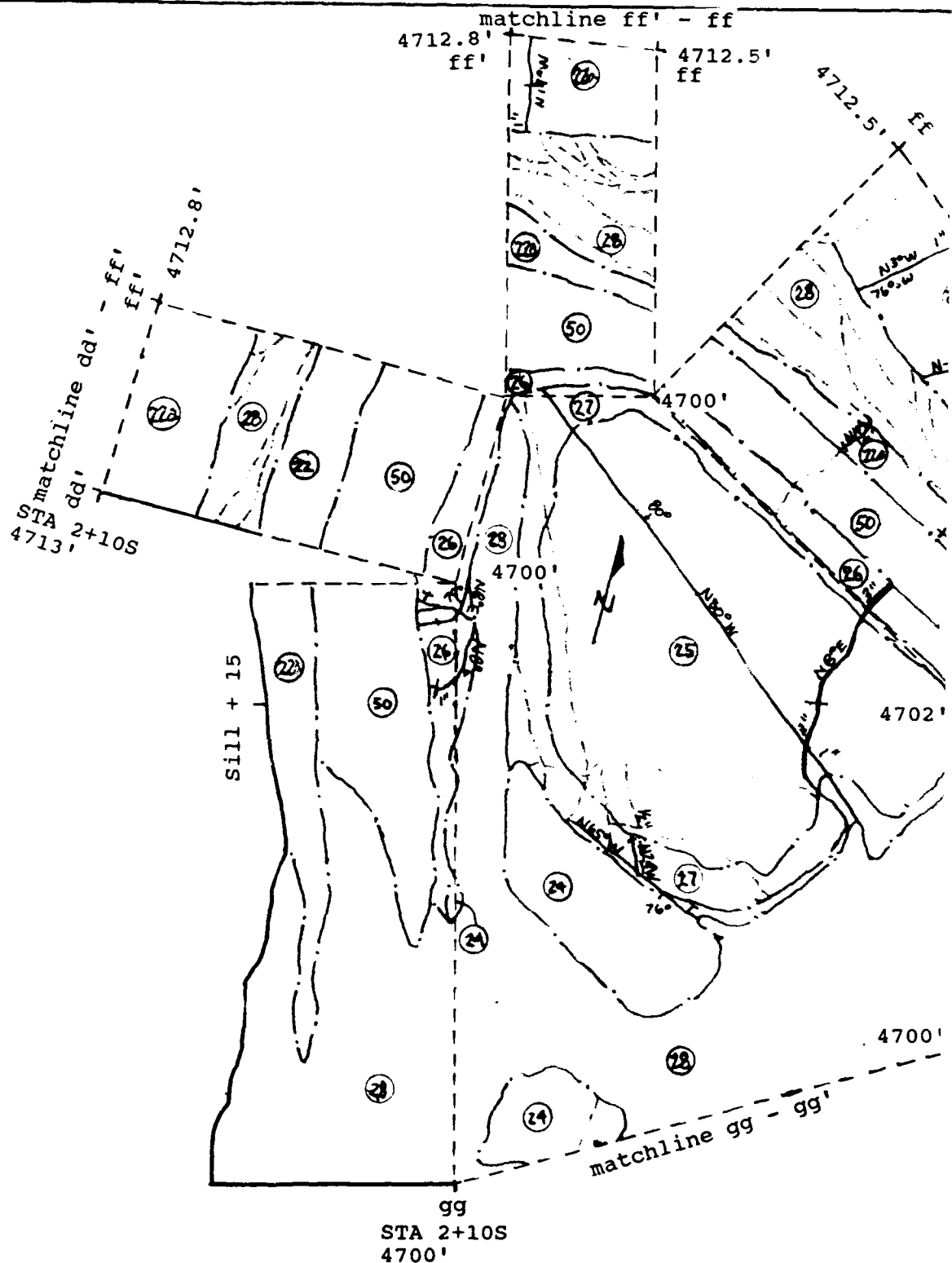


	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico	
DES. BY <u>CND</u>	RIO GRANDE & TRIBUTARIES	TOWNSHIP OF CONDESAUNTES, N.M.
DATE <u>CND</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CAL. BY <u>W.S.</u>	AUXILIARY SPILLWAY LEFT SIDE STA 1+73.58 to STA 2+105	
 DATE: <u>6 Oct 92</u>		Plate No. D-40



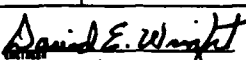




 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CND</u>	810 GRADE & TIE/STATION TIE/IN ON CONSTRUCTION, U.S.	
CHK. BY <u>CND</u>	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
DATE BY <u>WSB</u>	AUXILIARY SPILLWAY LEFT SIDE STA 2+105 to STA 2+115	
Drawn by <u>David E. Wright</u> DATE: <u>6 Oct 92</u>		Plate No. D-41



Scale: 1 inch = 5 feet

	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CD</u>	BIO GRANDE & TRIBUTARIES		
DRW. BY <u>CD</u>	CUCHILLO NEGRO DAM		
CHE. BY <u>WES</u>	Foundation Support FOUNDATION MAP AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.58 to STA 2+105		
 DATE: <u>6 Oct 92</u>		Plate No. D-42	

4711'

nn' matchline ee - nn' ee

matchline ee - cc'

CC'

matchline cc' - k

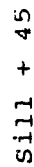
matchline pp. nm,





Scale: 1 inch = 5 feet

pp
STA 1+62.5S
4700'

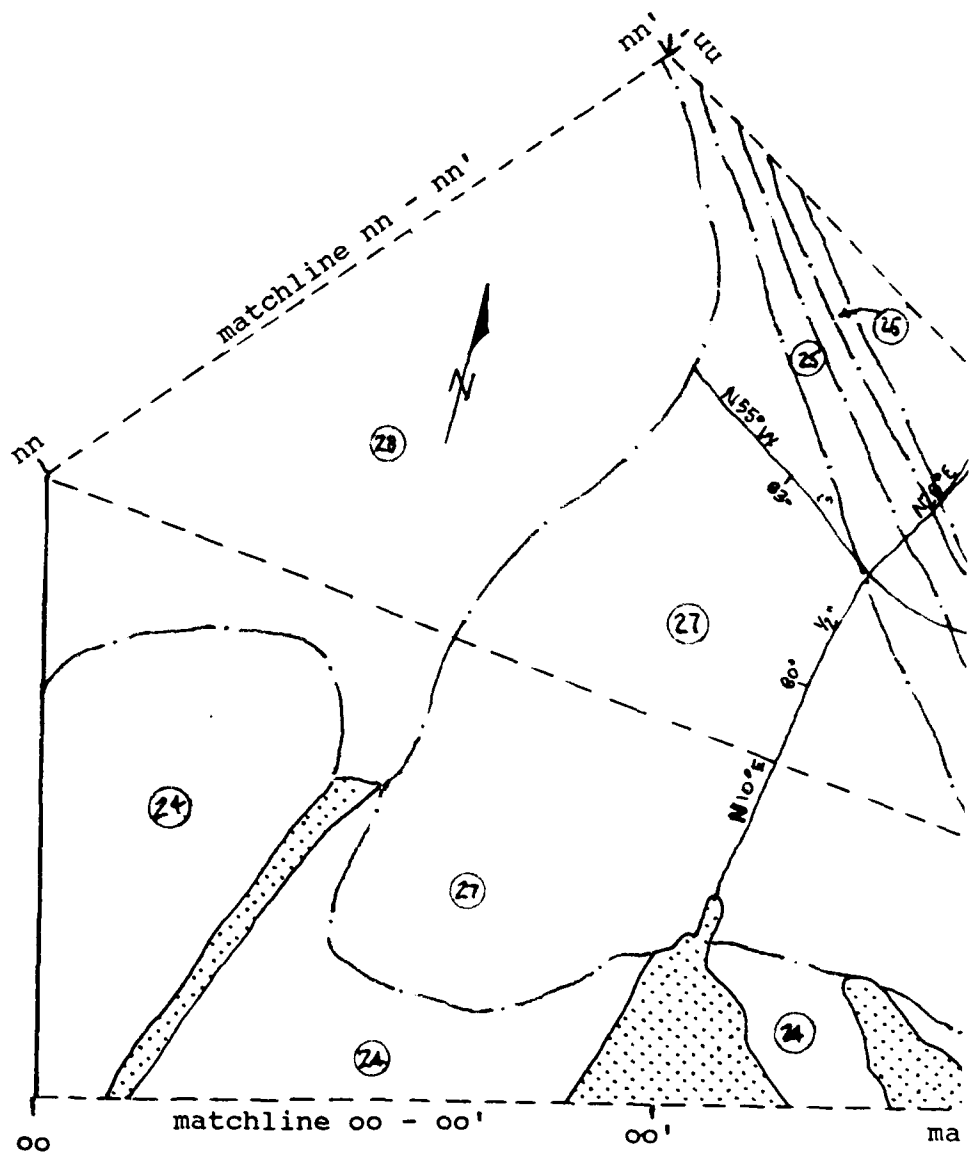
matchline cc' - bb'



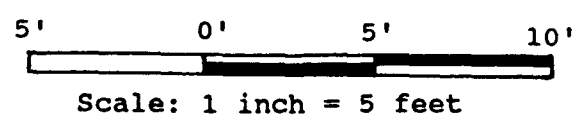
matchline pp - pp'

	U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico	
DET. BY <u>CSD</u>	RIO GRANDE & TRIBUTARIES TUNN ON COMMENCEMENT, D.R. CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP AUXILIARY SPILLWAY LEFT SIDE DS STA 1+41S to STA 1+92.5S	
DATE BY <u>CSD</u>		
CHK. BY <u>WSB</u>		
David E. Wright ENGINEER DATE: <u>6 Oct 92</u>		Plate No. D-43

STA 1+92.5S
4711'



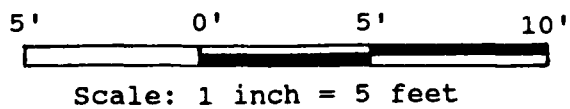
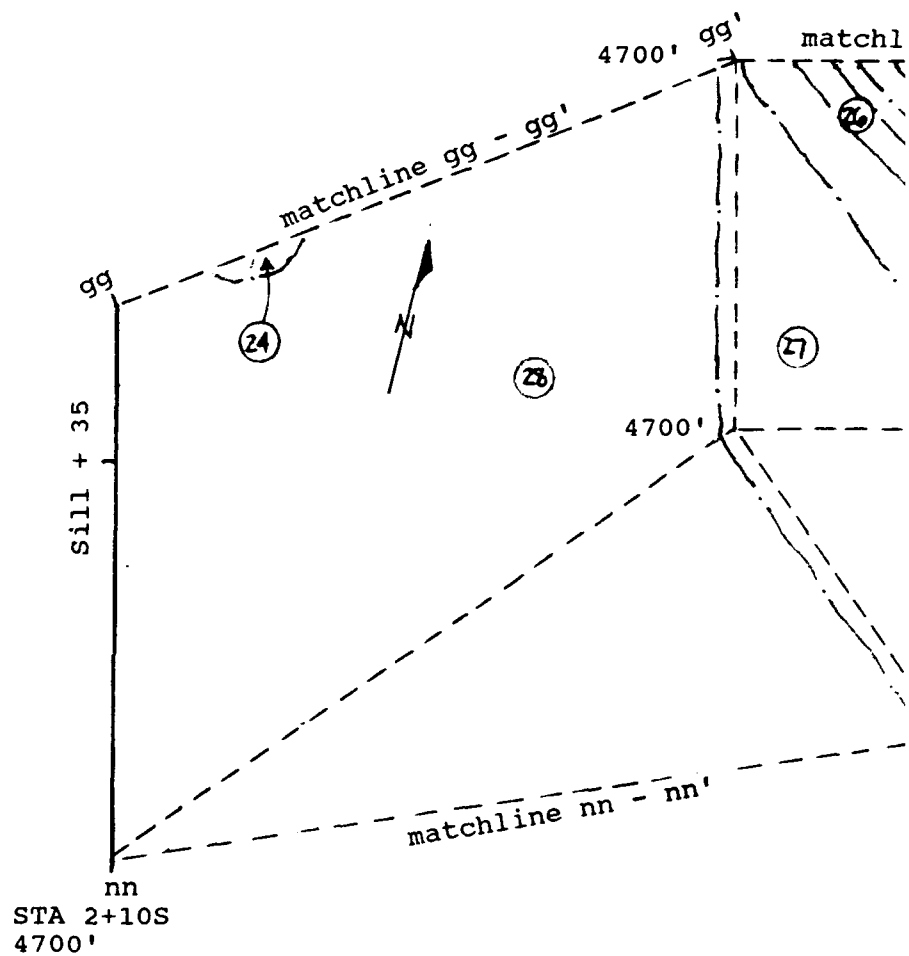
STA 2+10S
4700'

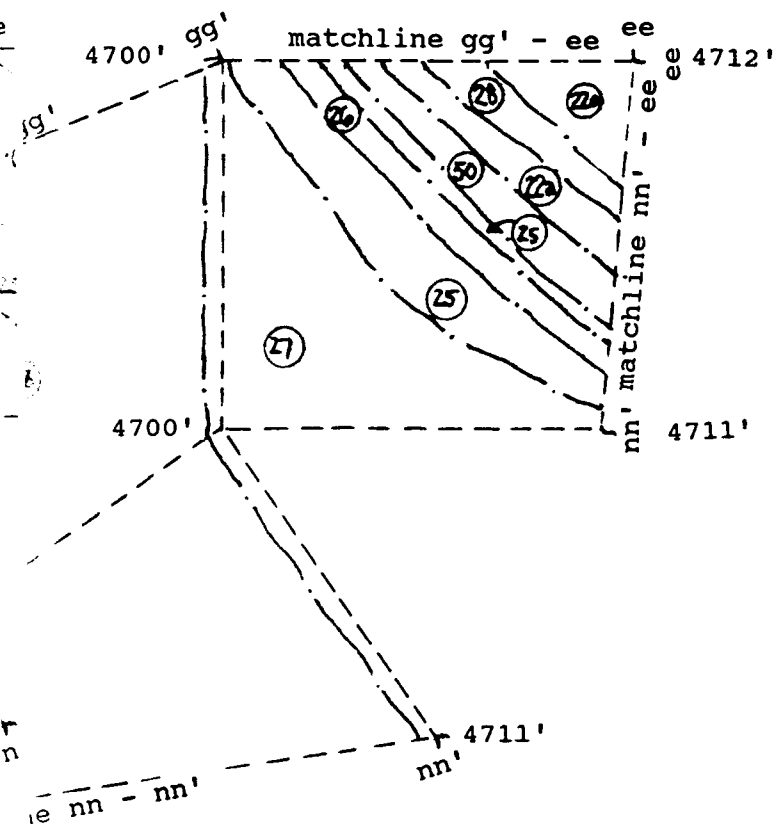




This geological map depicts a section of the Colorado Plateau. Key features include:

- Structural Data:**
 - Strike-slip fault: $N55^{\circ}W$, 63°
 - Normal fault: $N10^{\circ}E$, 60°
 - Normal fault: $N60^{\circ}E$, 62°
 - Normal fault: $E-W$, 62°
- Geological Features:**
 - Sill + 45:** A prominent feature in the upper right.
 - Matchlines:** Indicated by dashed lines labeled "matchline pp - nn" and "matchline oo' - pp".
 - Topography:** Shaded areas represent higher elevations or specific geological units.
- Stationing and Coordinates:**
 - Station 1+62.5S is marked at the bottom right.
 - Elevation of 4700' is noted at the bottom right.
 - Points nn' , nn , oo' , and pp are labeled at various locations.
- Other Labels:**
 - Numbers in circles: 24, 25, 26, 27, 50, 22a.
 - Letters: nn' , nn , oo' , pp .

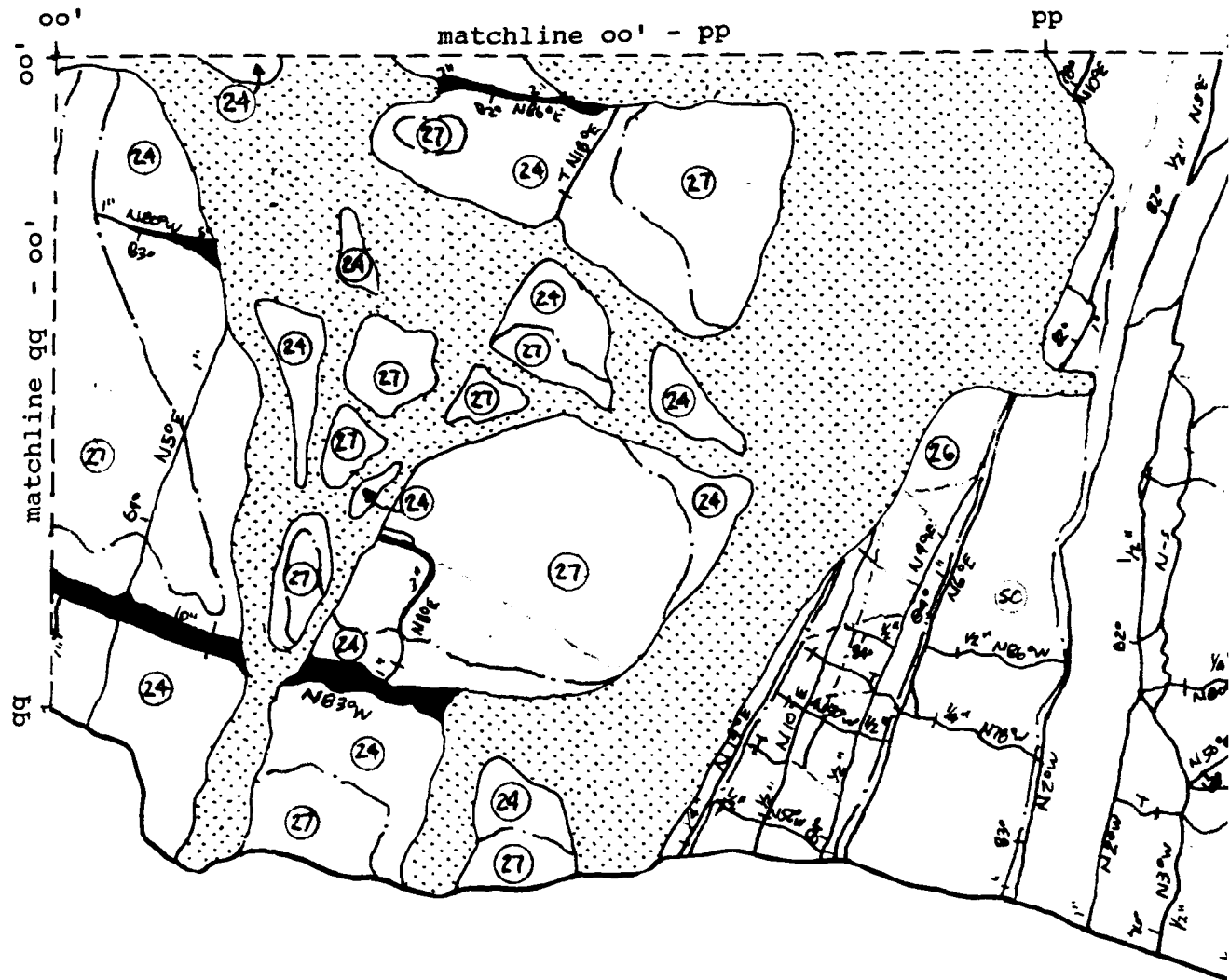
D-48





 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	SIO GRADE & TRIANGULATION TENTS BY CONSTRUCTION, S.A.	
DES. BY <u>CSD</u>	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.58 to STA 2+103	
DES. BY <u>WSE</u>	DATE: <u>6 Oct 92</u>	
Plate No. D-45		

STA 1+92.5S
4700'

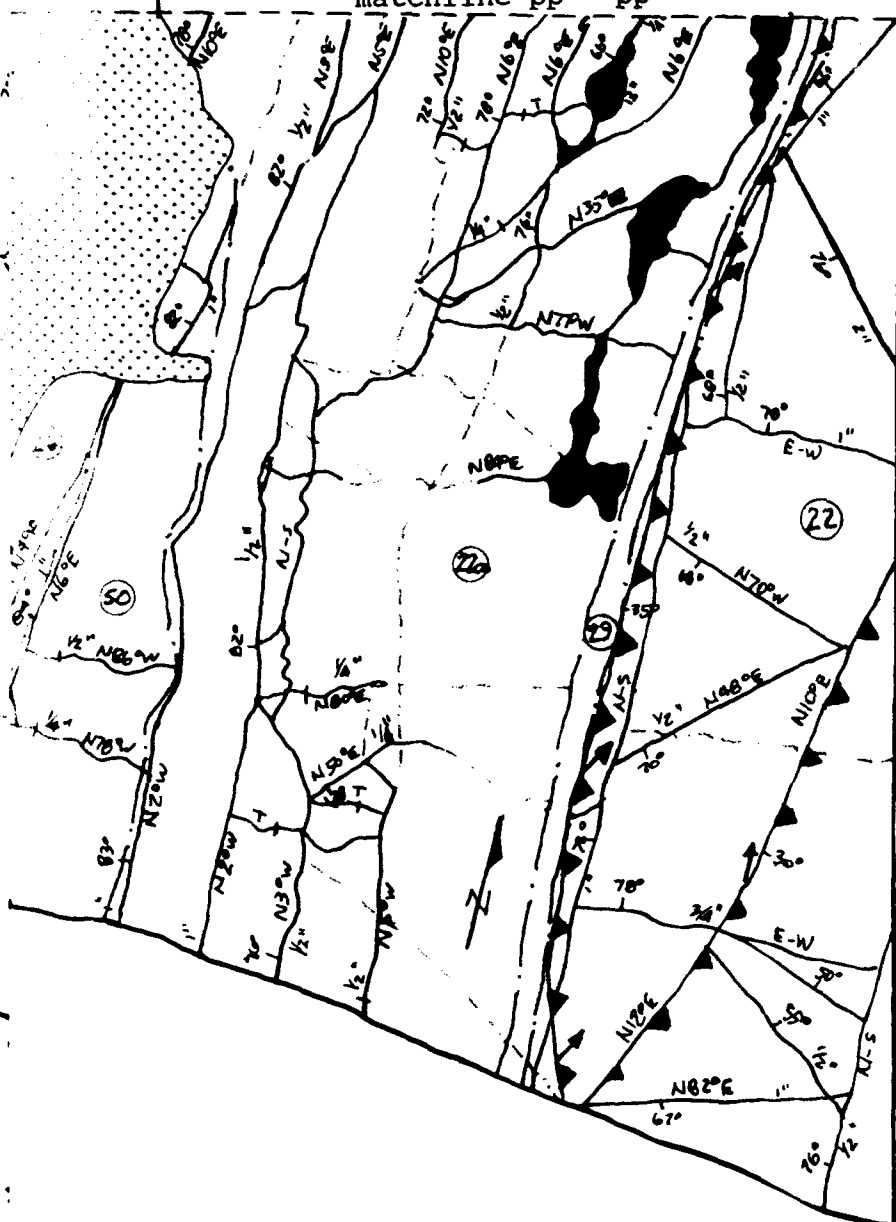


STA 1+41S
4700'



pp

matchline pp - pp'

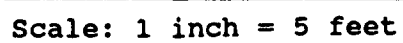
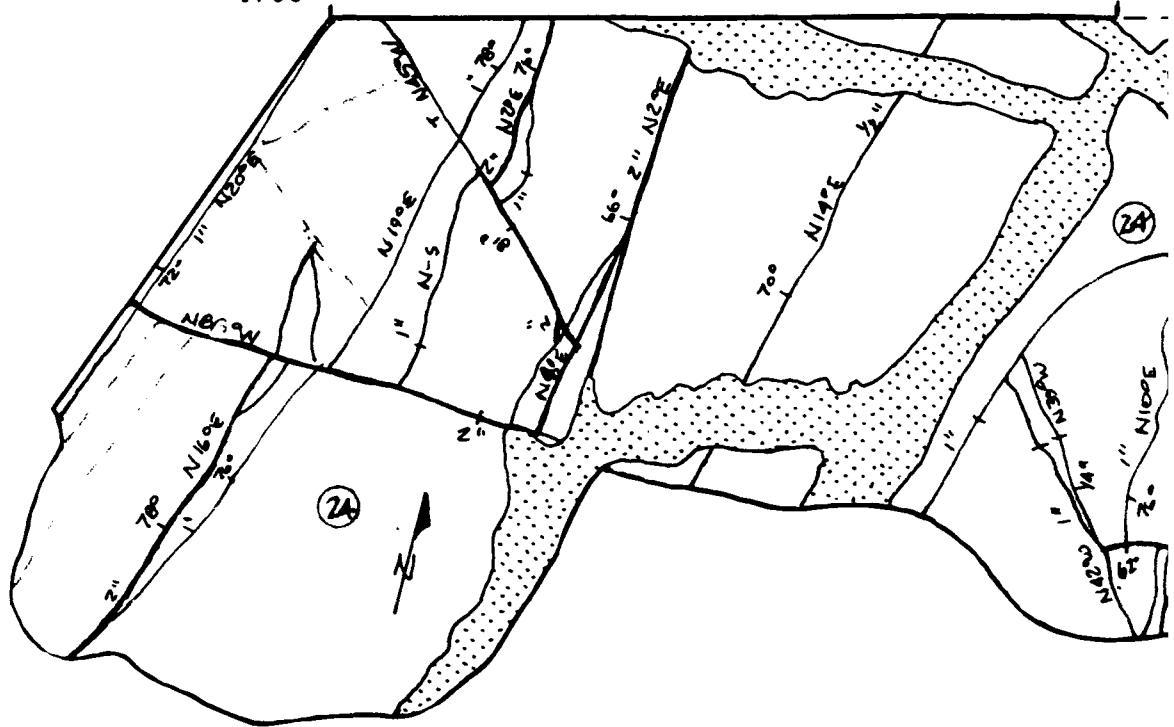
pp'

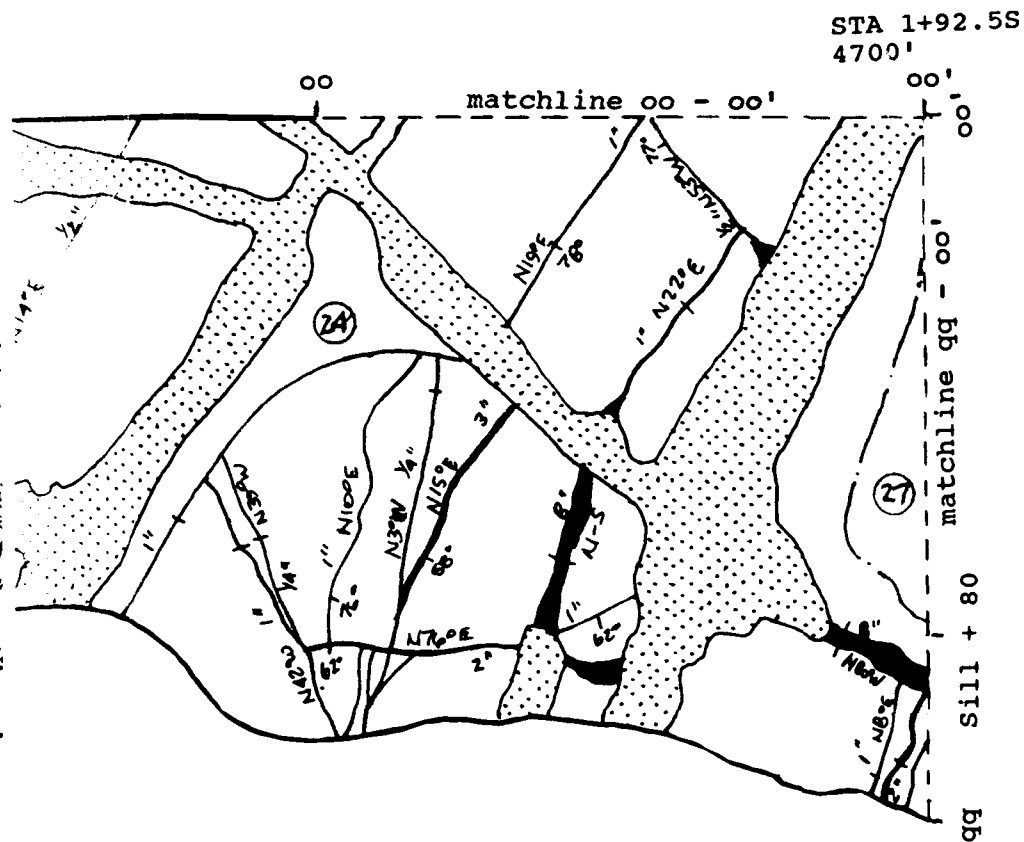




Sill + 80

 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	210 GRADE & TIE/STAKES TIE/STAKES OR CORRELATIONS, S.D.	
DWG. BY CSD	CUCHILLO NEGRO DAM Foundation Report	
CHK. BY WSB	FOUNDATION MAP AUXILIARY SPILLWAY LEFT SIDE DS STA 1+41S to STA 1+92.58	
Daniel E. Wright DATE: 6 Oct 92		Plate No. D-46

oo





 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CDD	510 GRADE & TIEUPATHS	TYPED BY CHARTERHOUSE, S.A.
DES. BY CDD	COCHILLO NEGRO DAM Foundation Report	
DES. BY CDD	FOUNDATION MAP AUXILIARY SPILLWAY LEFT SIDE DS STA 1+92.55 to STA 2+35.55	
DES. BY WGS	Date: 6 Oct 92	
Plate No. D-47		

AUXILIARY SPILLWAY SILL CUT

TABLE OF CONTENTS
AUXILIARY SPILLWAY SILL CUT

Plate No.	Title	Page No.
D-48	AUXILIARY SPILLWAY SILL CUT STA 2+11S to STA 3+45S.....	D-53
D-49	AUXILIARY SPILLWAY SILL CUT STA 3+45S to STA 4+75S.....	D-54
D-50	AUXILIARY SPILLWAY SILL CUT STA 4+75S to STA 6+05S.....	D-55
D-51	AUXILIARY SPILLWAY SILL CUT STA 6+05S to STA 7+35S.....	D-56
D-52	AUXILIARY SPILLWAY SILL CUT STA 7+35S to STA 8+06S.....	D-57

AA'
AA matchline AA - AA'

④

②

③

④

Looking N14°W

STA 2+80S

BB'
BB matchline BB - BB'

⑨

③

⑦

③

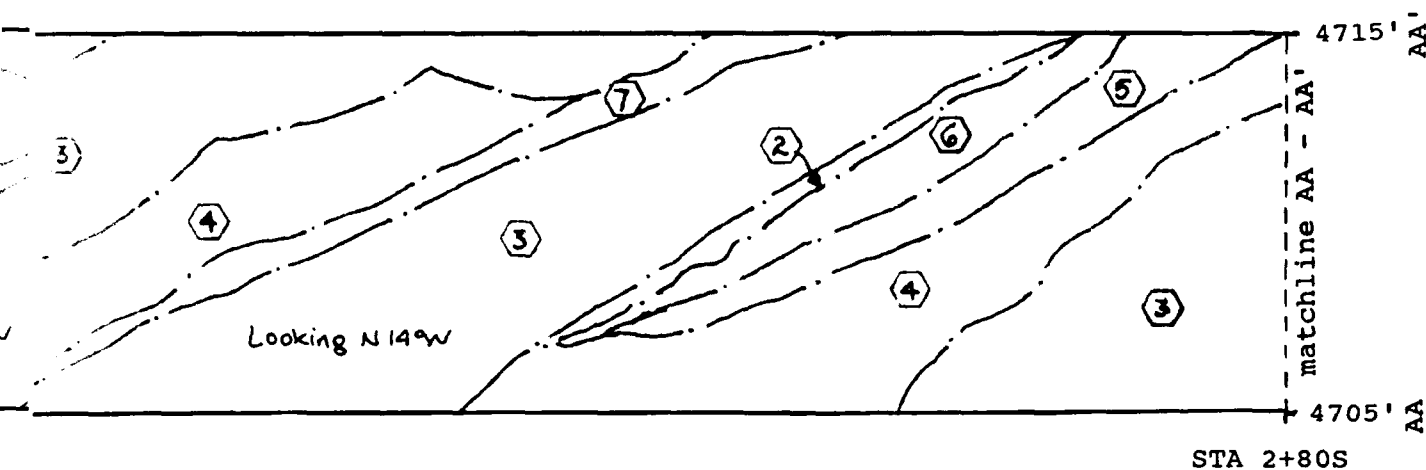
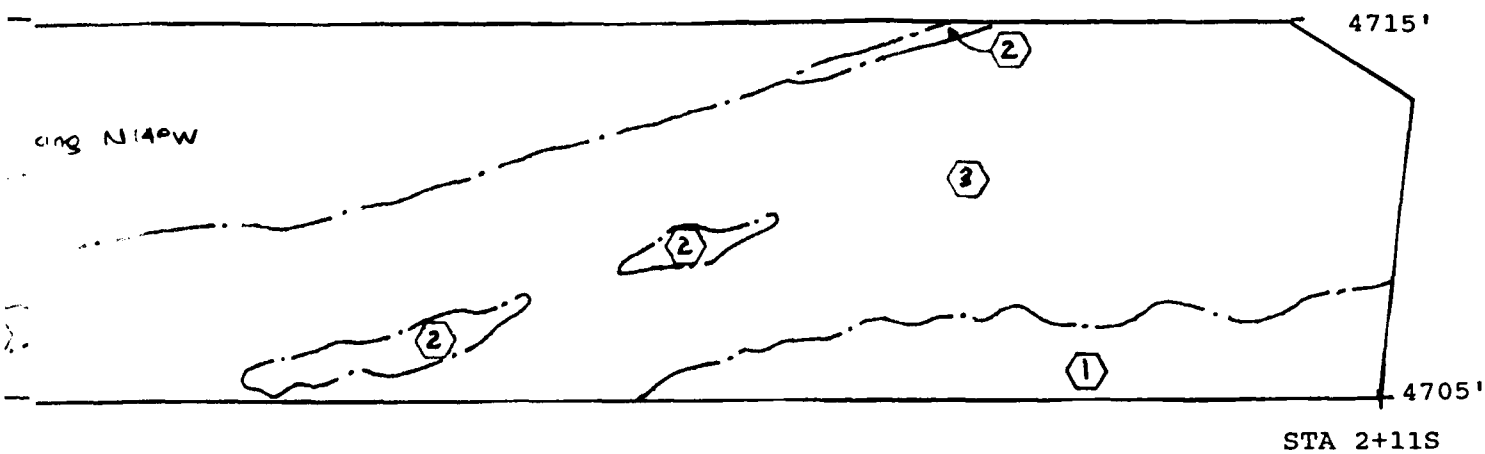
④



Looking N

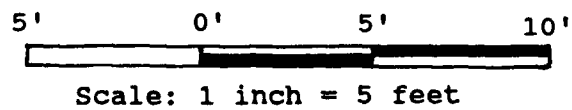
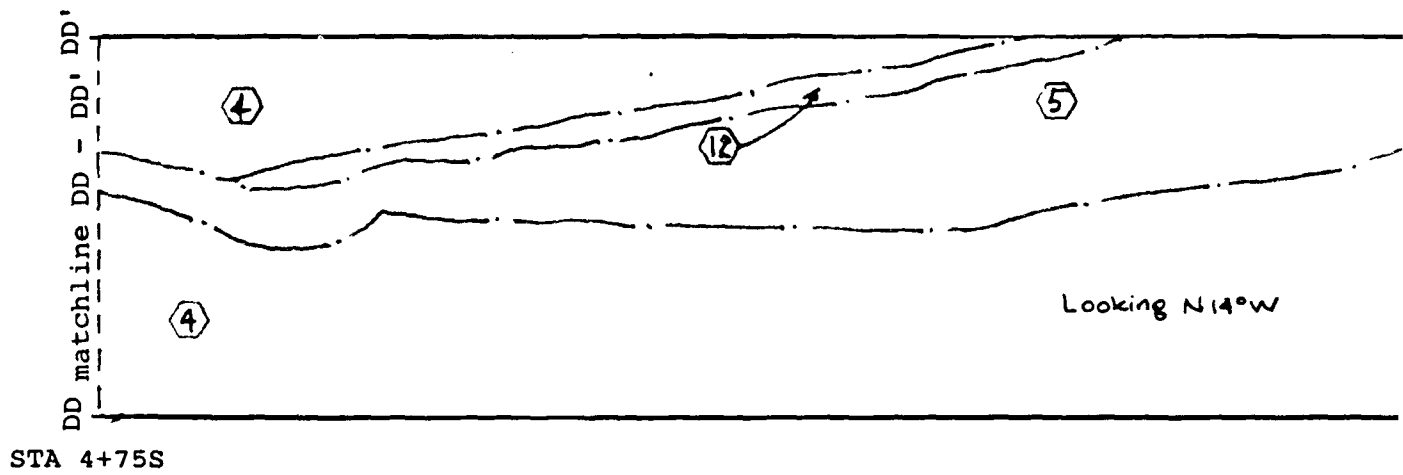
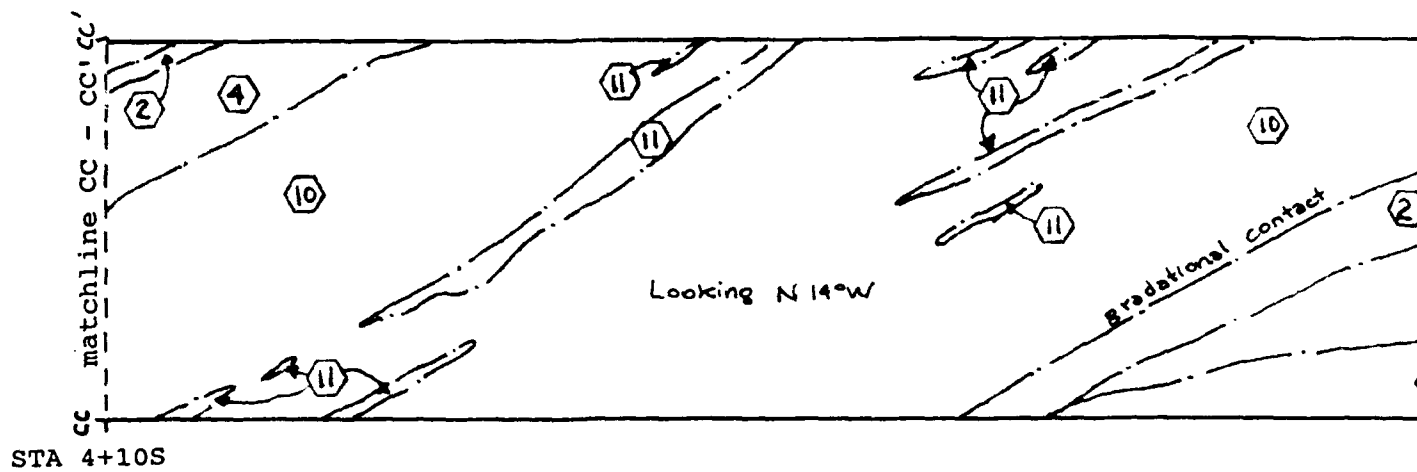
STA 3+45S

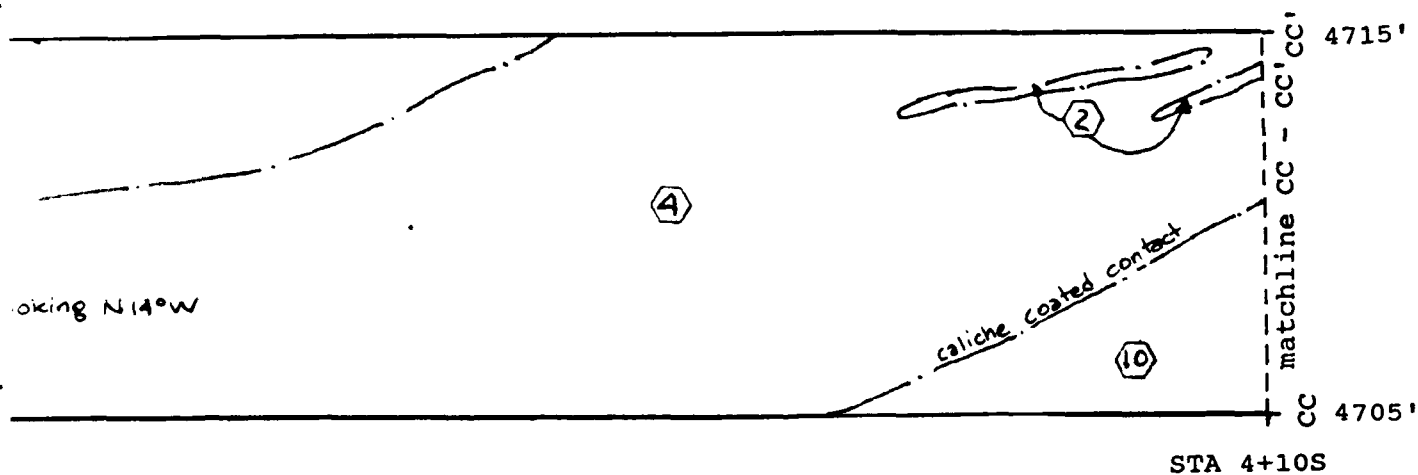
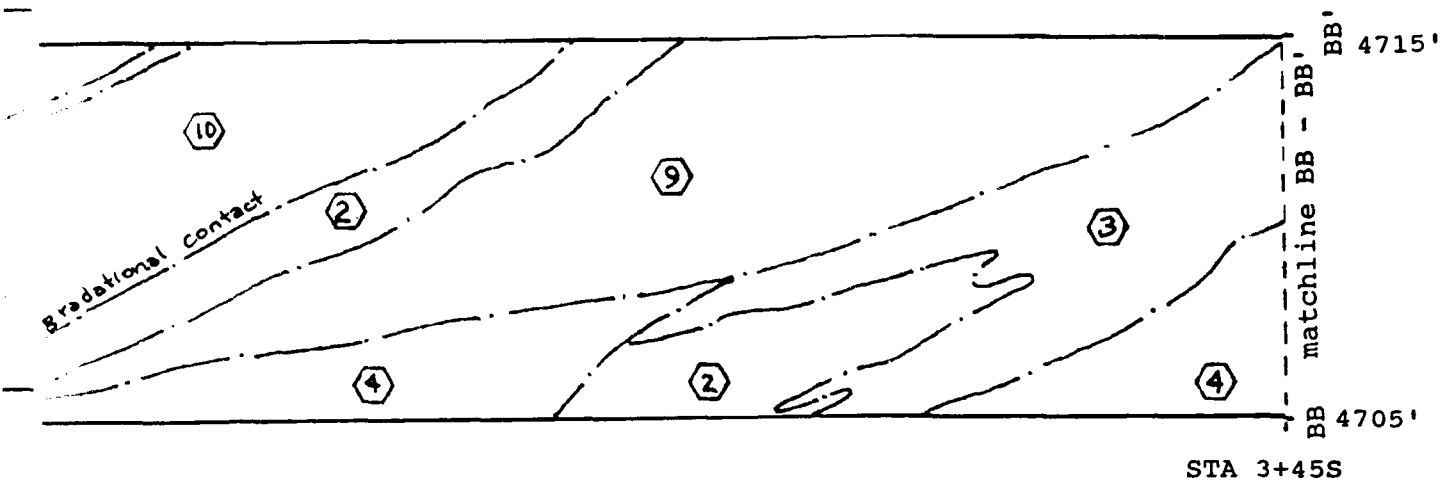




Scale: 1 inch = 5 feet

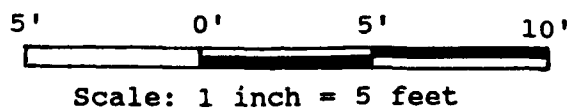
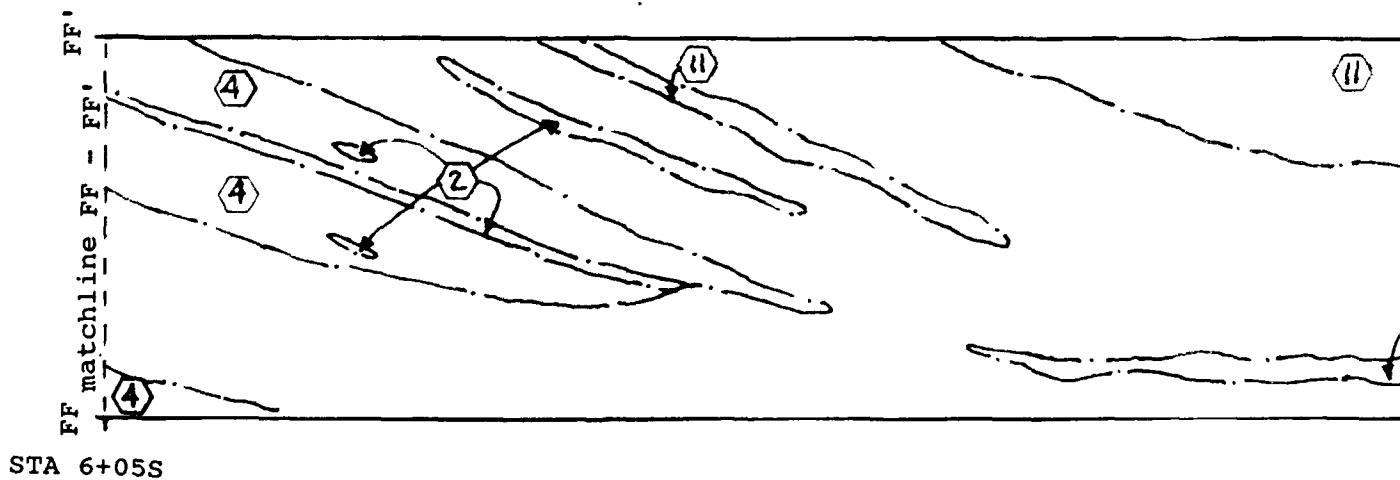
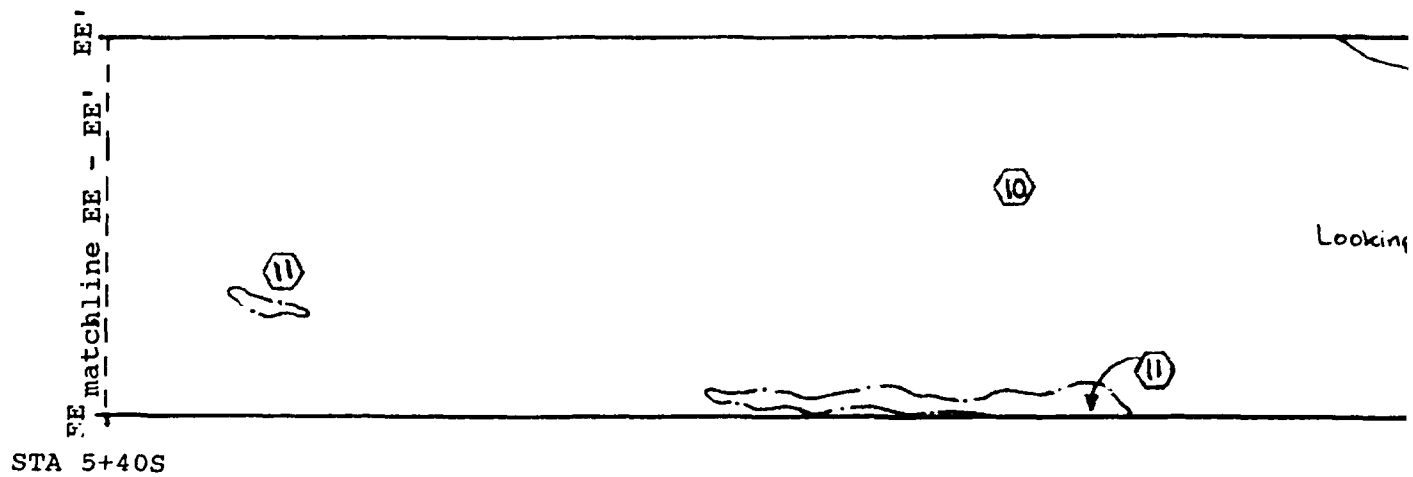


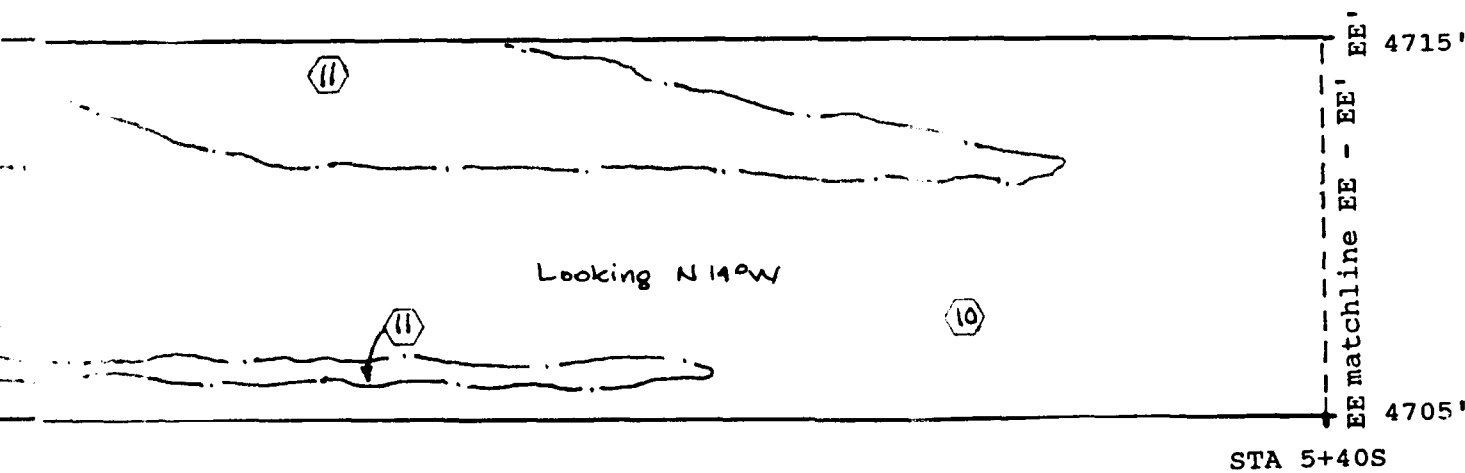
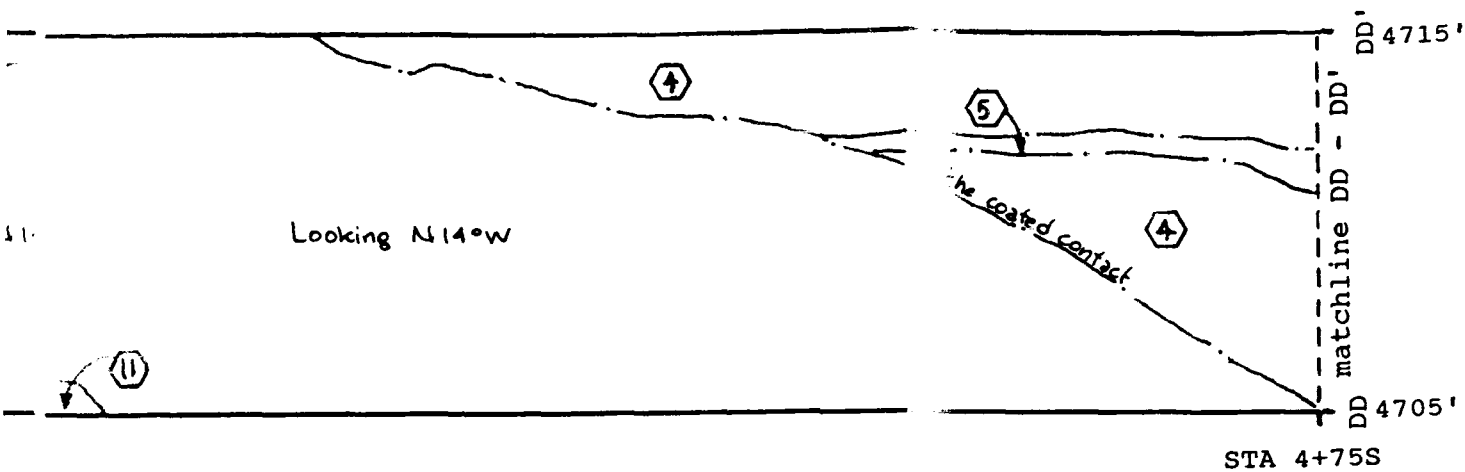
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	BIG GRADE & TRIANGULATION TYPED BY COMBATANT, U.S.	
DWG. BY CSD	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHE. BY WJ	AUXILIARY SPILLWAY STILL CUT STA 2+11S to STA 3+45S	
David E. Wright DATE: 6 Oct 92		Plate No. D-48





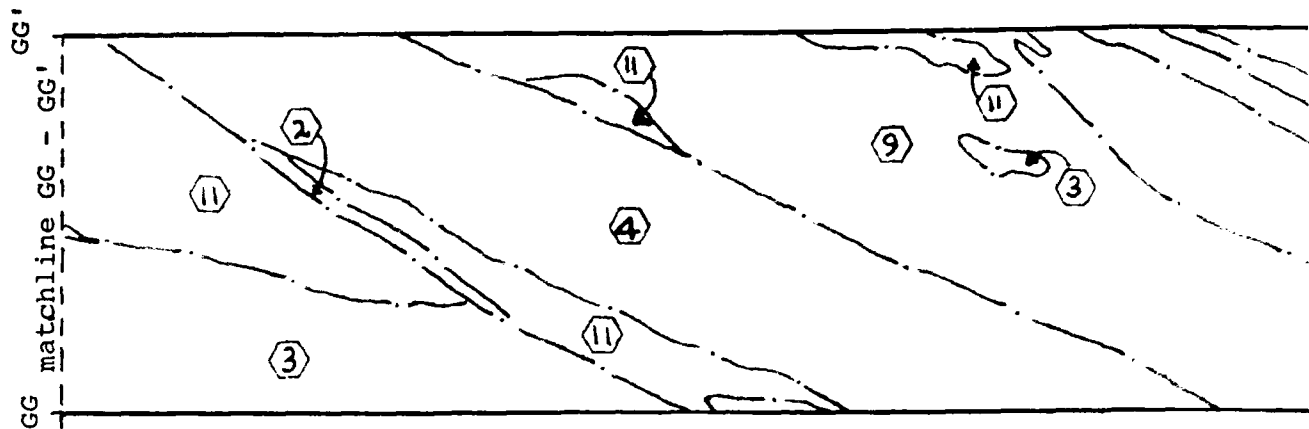


 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	SIO GRADE & TIE/STAKES	
CHK. BY CSD	YOUTH OF CONSTRUCTION, D.S.	
CHK. BY WSG	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP AUXILIARY SPILLWAY SILL CUT STA 3+45S to STA 4+75S	
David E. Knight DATE: 6 Oct 92		Plate No. D-49

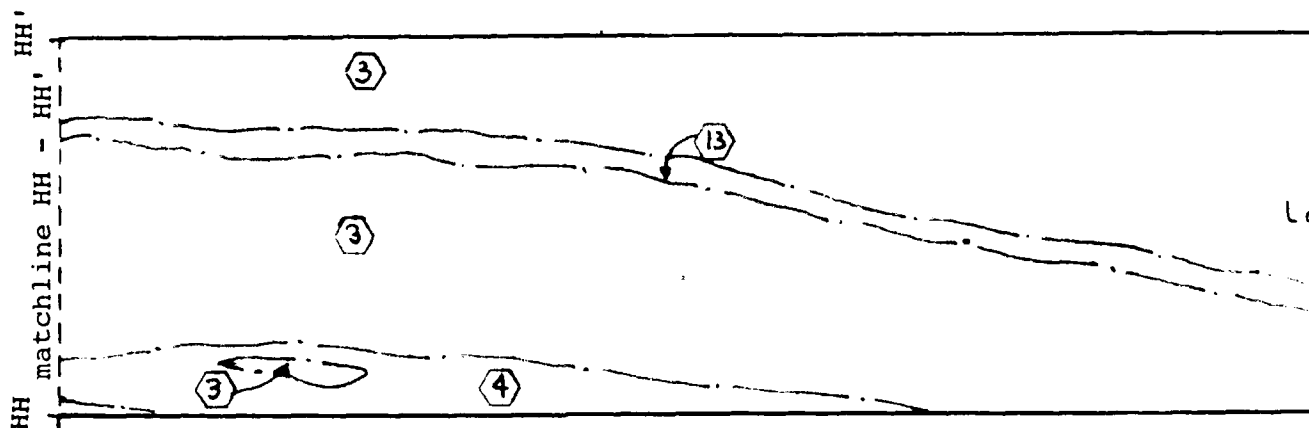




 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	STD. NAME & TOLERANCES TYPES OF CONSTRUCTION, E.T.	
REV. BY CSD	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY R56	AUXILIARY SPILLWAY SILL CUT STA 4+75S to STA 6+05S	
DATE: 6 Oct 92 Signature: <i>David E. Wright</i>		Plate No. D-50



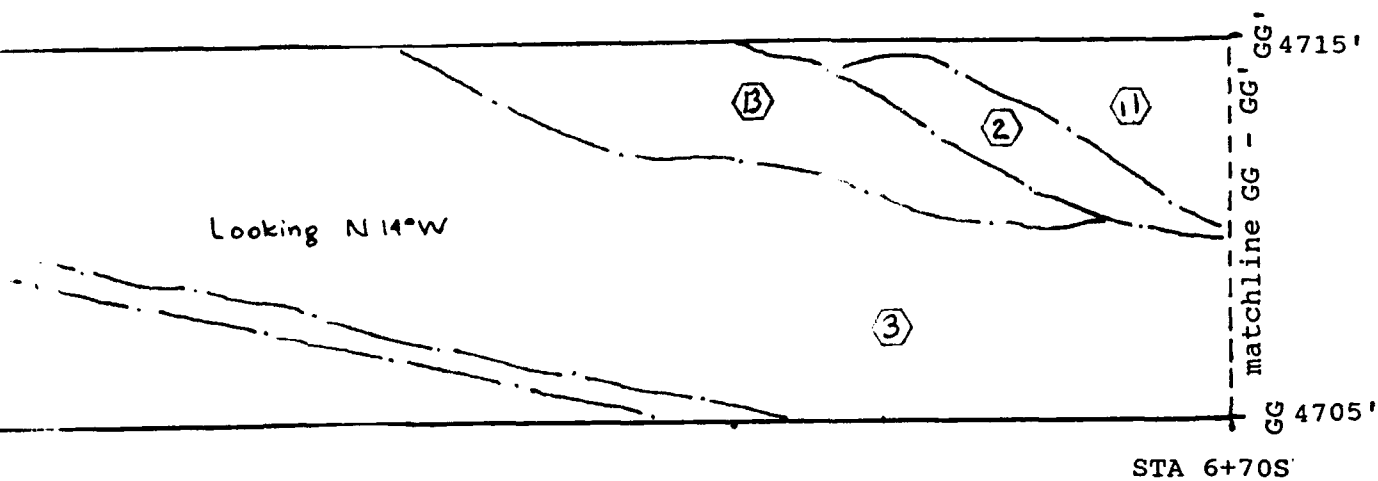
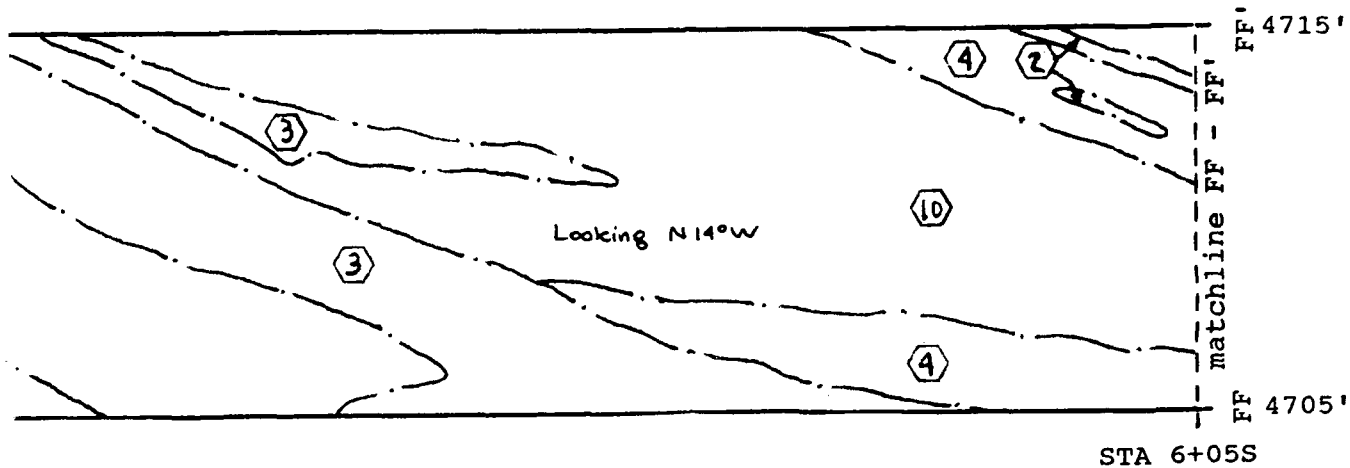
STA 6+70S





STA 7+35S



Scale: 1 inch = 5 feet



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	SIO GRABER & TRUBBART TOWN & COUNTRY, N.M.	
DWG. BY <u>CSD</u>	COCHILLO NEGRO DAM Foundation Repair FOUNDATION MAP	
CHE. BY <u>WSE</u>	AUXILIARY SPILLWAY STILL CUT STA 6+055 to STA 7+355	
Daniel E. Wright DATE: <u>6 OCT 92</u>		Plate No. D-51

II matchline II - II' II'
STA 7+90S

③
Looking N14°W

⑧

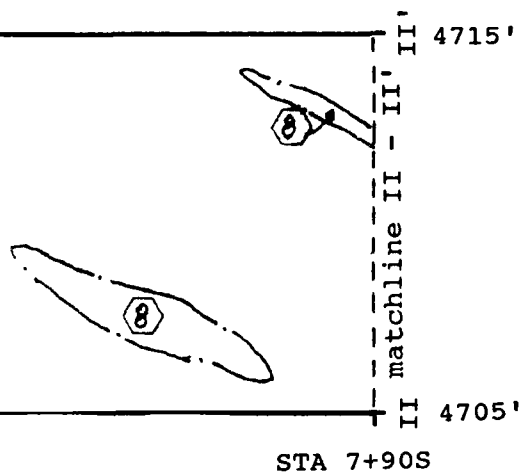
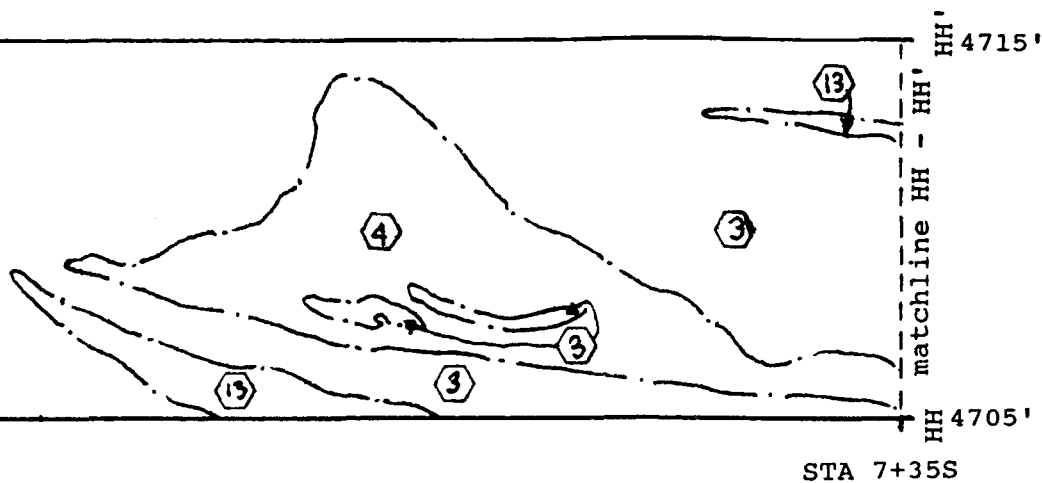
STA 8+06S



Looking N14°W

③

⑧

5' 0' 5' 10'
Scale: 1 inch = 5 feet

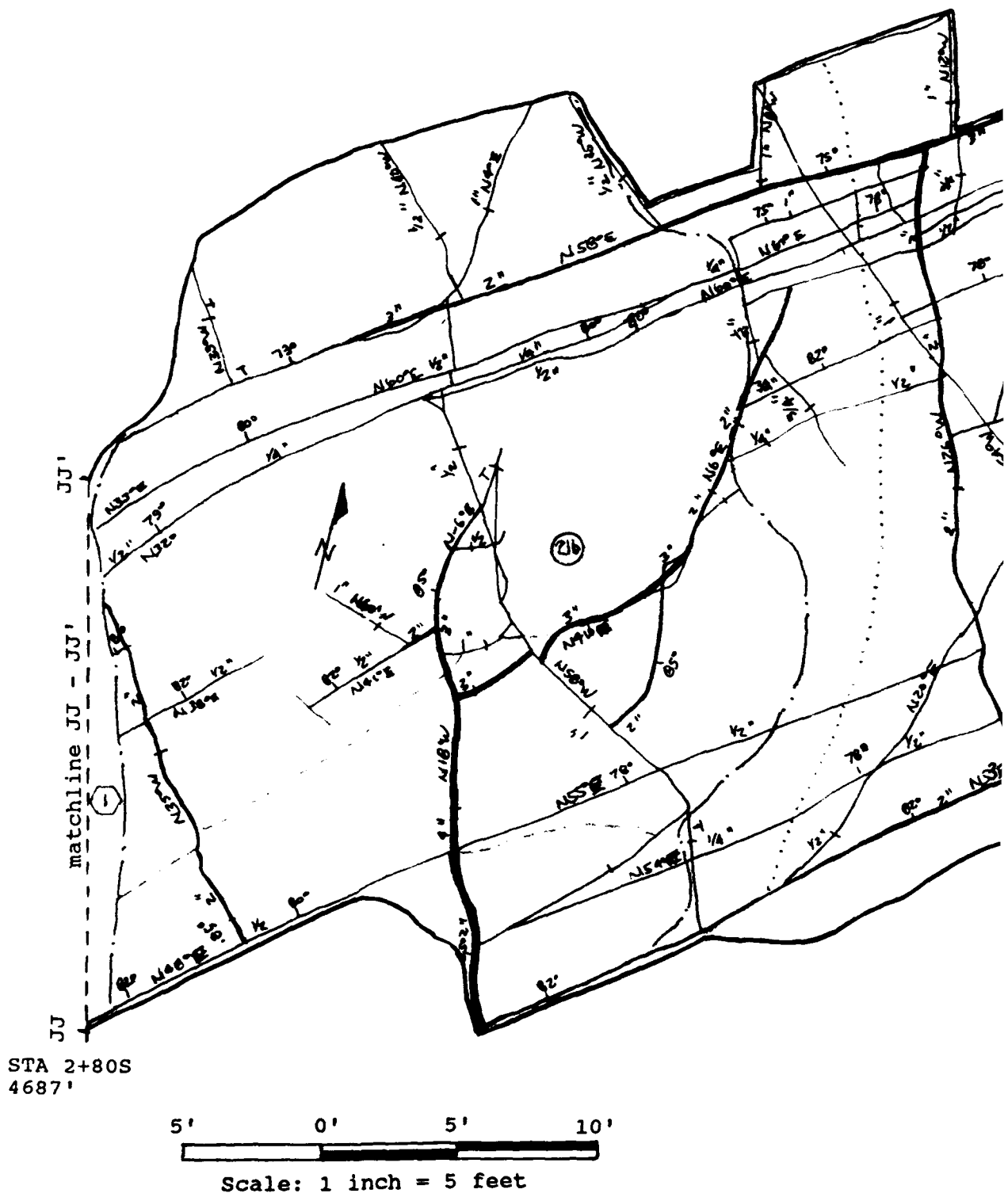


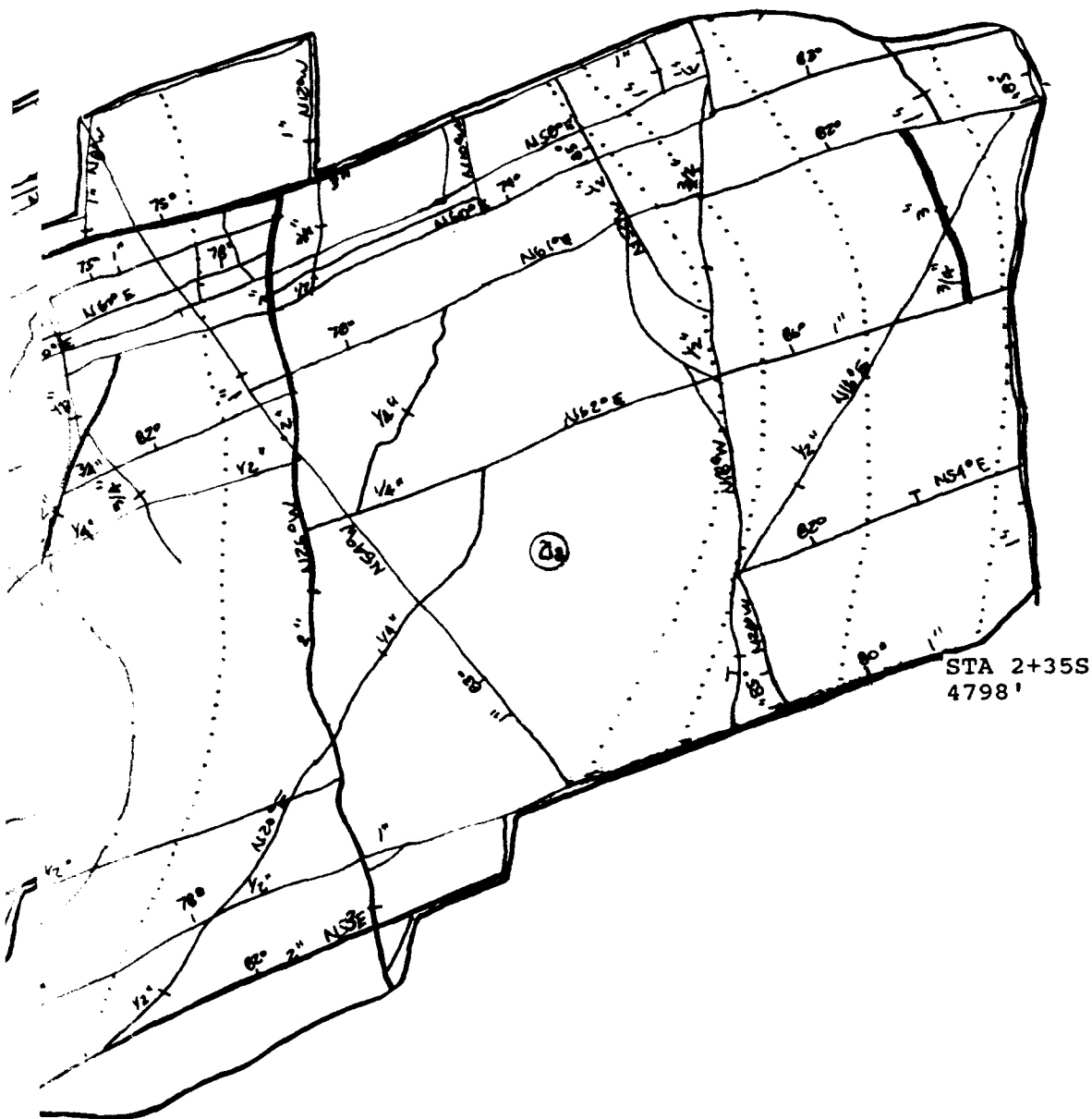
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	810 GRADES & TIE/STAKES TENTS OR CONDUIT/PIPE, U.S.	
DES. BY <u>CAD</u>	CUCHILLO NEGRO DAM Foundation Report	
CHK. BY <u>WYS</u>	FOUNDATION MAP AUXILIARY SPILLWAY SILL CUT STA 7+35S to STA 8+06S	
DAVID E. WRIGHT DATE: <u>6 Oct 92</u>		Plate No. D-52



AUXILIARY SPILLWAY CHUTE TOE

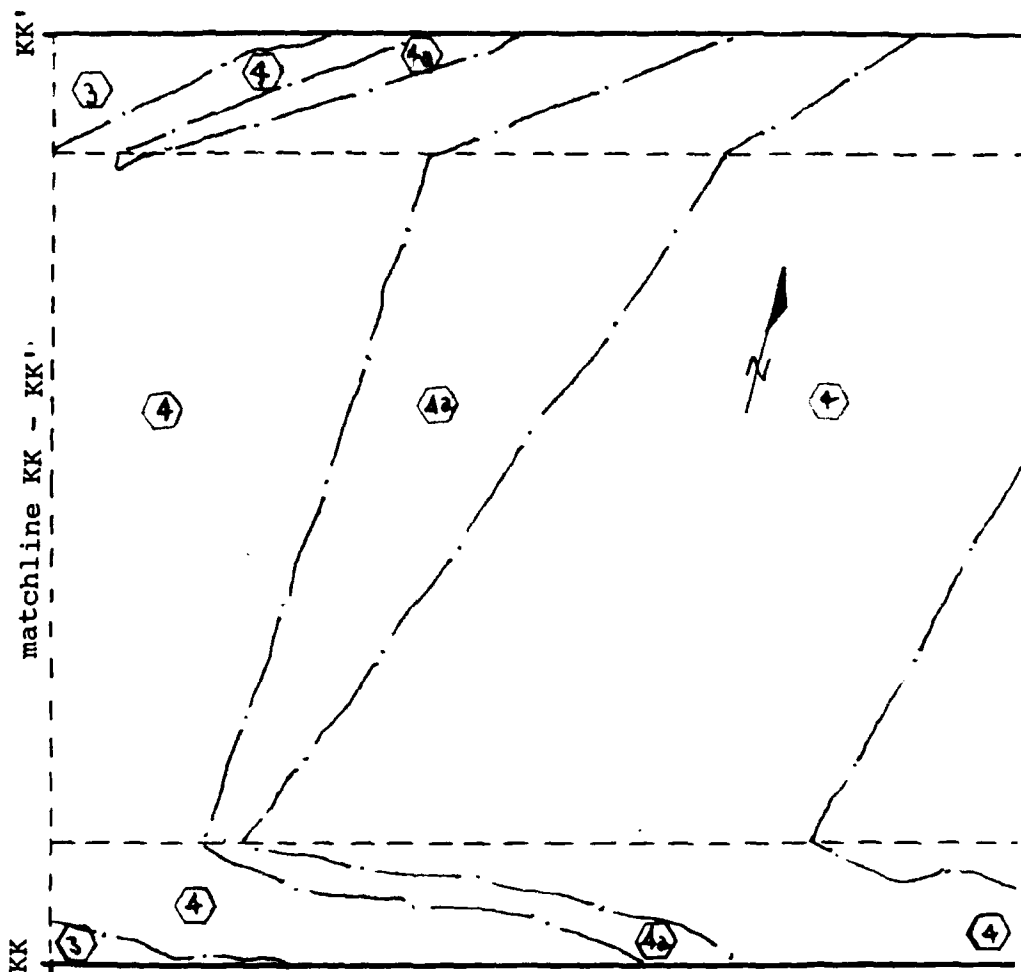
TABLE OF CONTENTS
AUXILIARY SPILLWAY CHUTE TOE

Plate No.	Title	Page No.
D-53	AUXILIARY SPILLWAY CHUTE TOE STA 2+35S to STA 2+80S.....	D-59
D-54	AUXILIARY SPILLWAY CHUTE TOE STA 2+80S to STA 3+25S.....	D-60
D-55	AUXILIARY SPILLWAY CHUTE TOE STA 3+25S to STA 3+85S.....	D-61
D-56	AUXILIARY SPILLWAY CHUTE TOE STA 3+85S to STA 4+45S.....	D-62
D-57	AUXILIARY SPILLWAY CHUTE TOE STA 4+45S to STA 5+05S.....	D-63
D-58	AUXILIARY SPILLWAY CHUTE TOE STA 5+05S to STA 5+65S.....	D-64
D-59	AUXILIARY SPILLWAY CHUTE TOE STA 5+65S to STA 6+25S.....	D-65
D-60	AUXILIARY SPILLWAY CHUTE TOE STA 6+25S to STA 6+85S.....	D-66
D-61	AUXILIARY SPILLWAY CHUTE TOE STA 6+85S to STA 7+45S.....	D-67
D-62	AUXILIARY SPILLWAY CHUTE TOE STA 7+45S to STA 8+05S.....	D-68
D-63	AUXILIARY SPILLWAY CHUTE TOE STA 8+05S to STA 8+33S.....	D-69

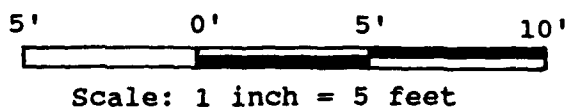


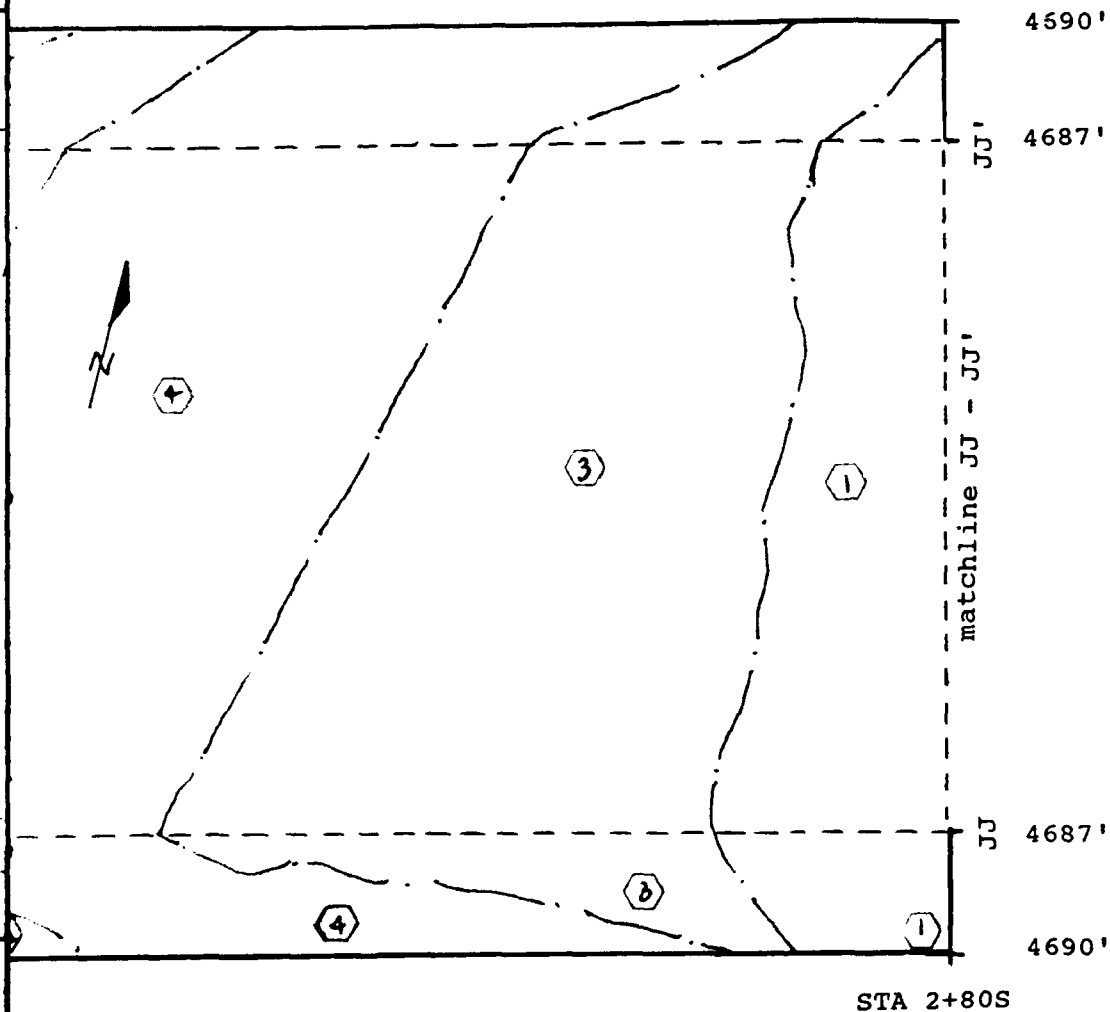


 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	670 GRADE & TIE-INS TOWNSHIP OF CHANDLER, N.M.	
DES. BY CSD	COCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
DES. BY WBS	AUXILIARY SPILLWAY CHUTE FOR STA 2+355 to STA 2+805	
David E. Wright DATE: 6 Oct 92		Plate No. D-53

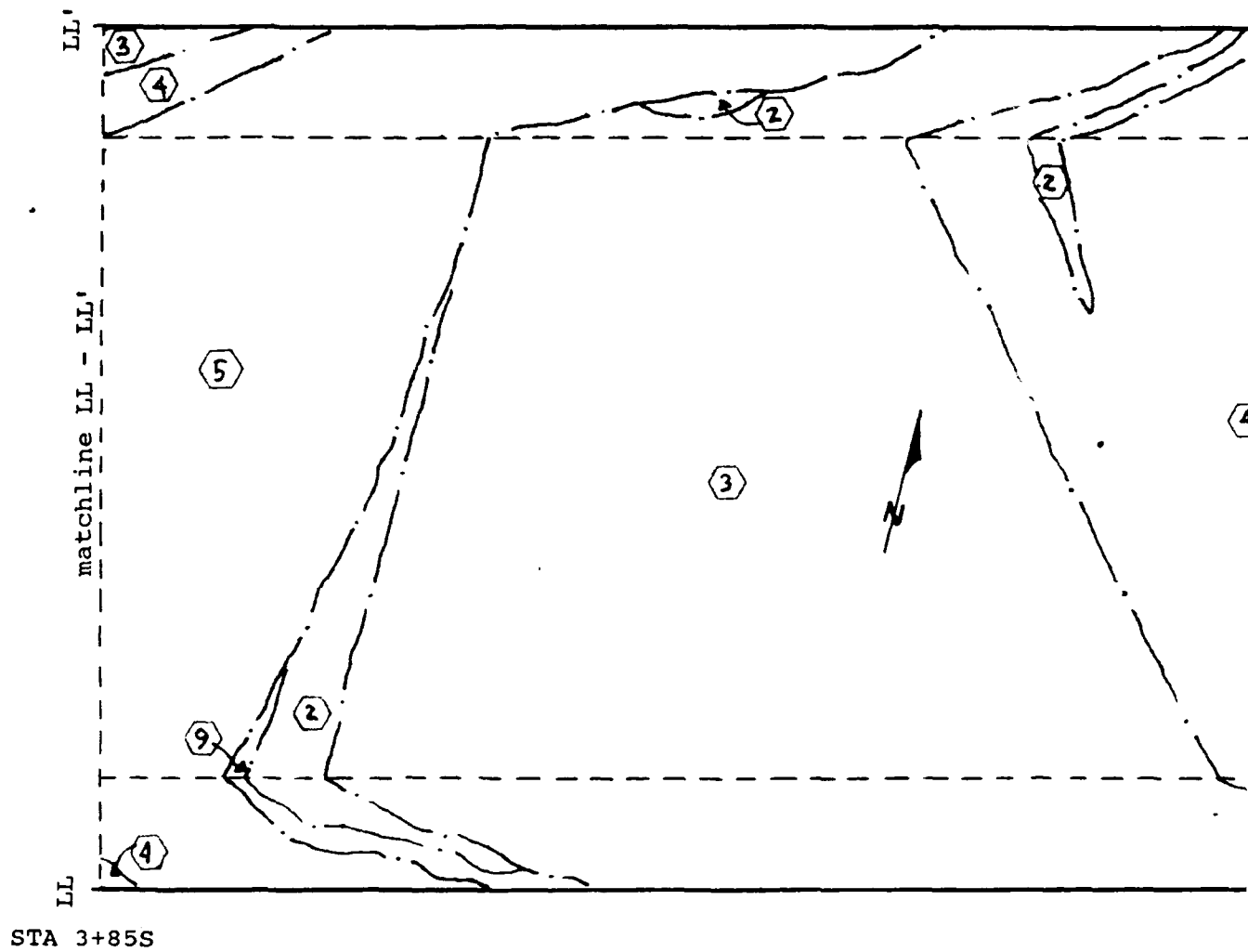


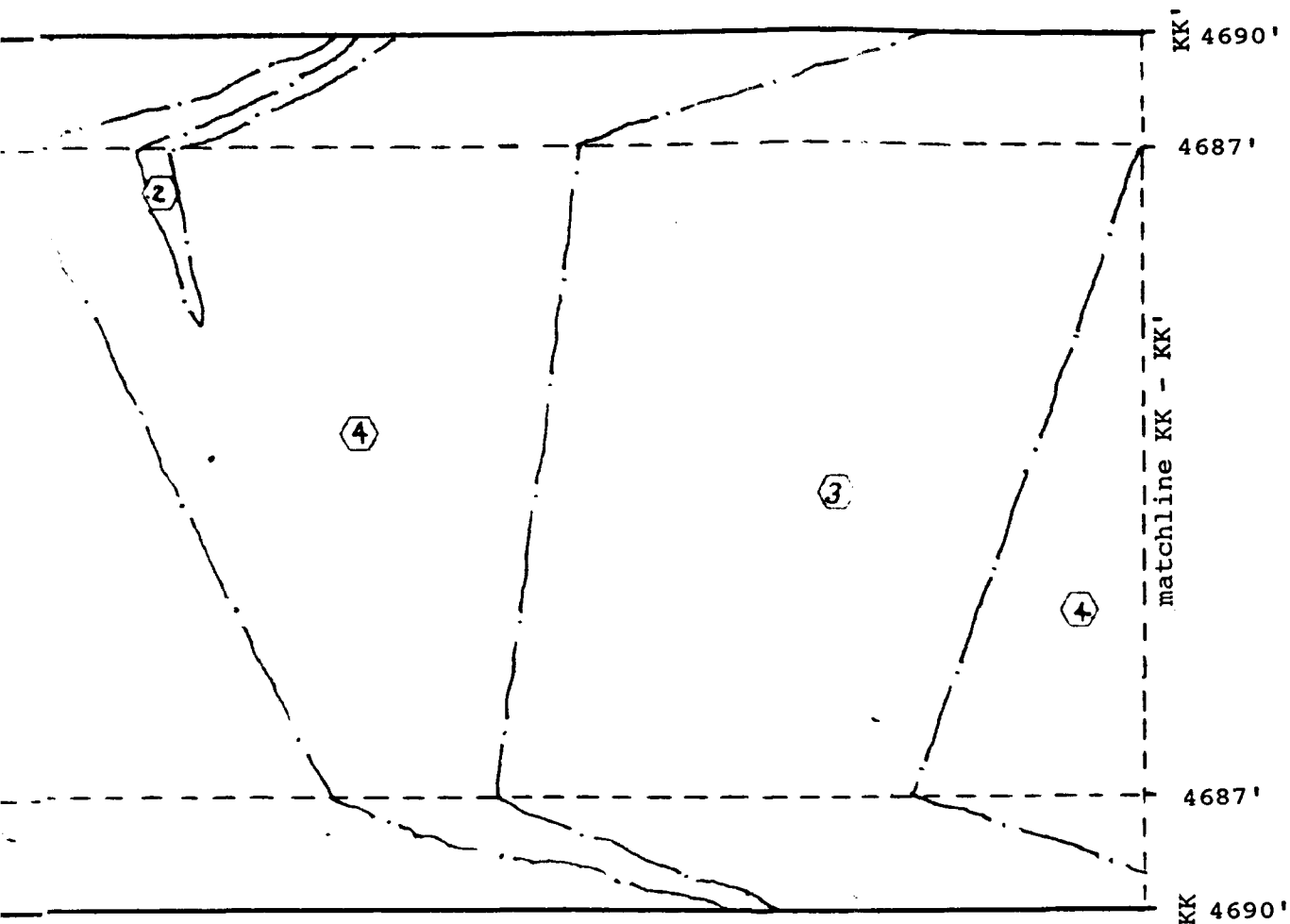
STA 3+25S







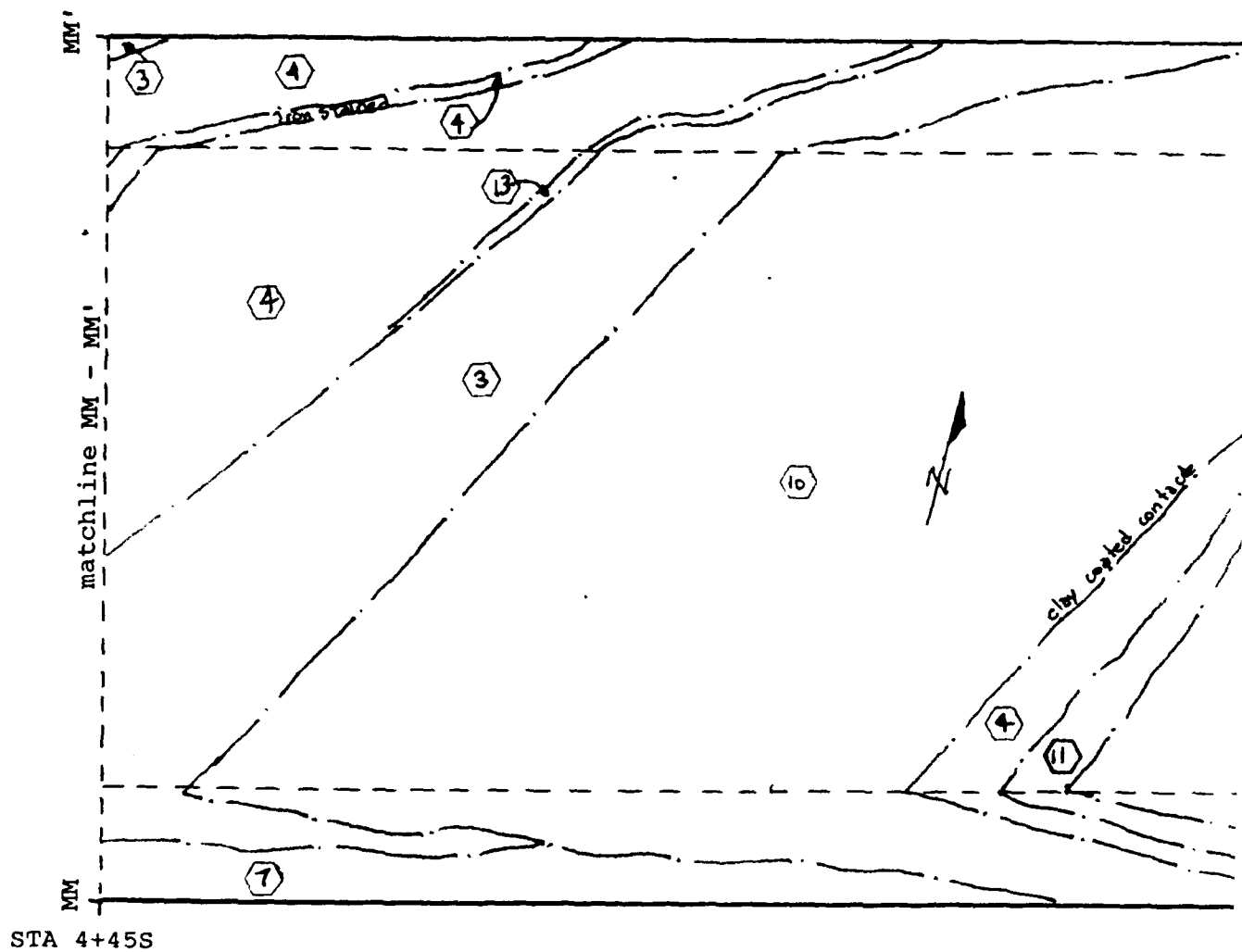
U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	RIG GRADE & TIEPOINTS TIEPOINTS ON COMPONENTS, E.A.	
DES. BY CSD	CUCHILLO NEGRO DAM Foundation Support FOUNDATION MAP	
DES. BY W55	AUXILIARY SPILLWAY CHUTE TOE STA 2+80S to STA 3+25S	
DAVID E. WRIGHT DATE: Oct 92		Plate No. D-54

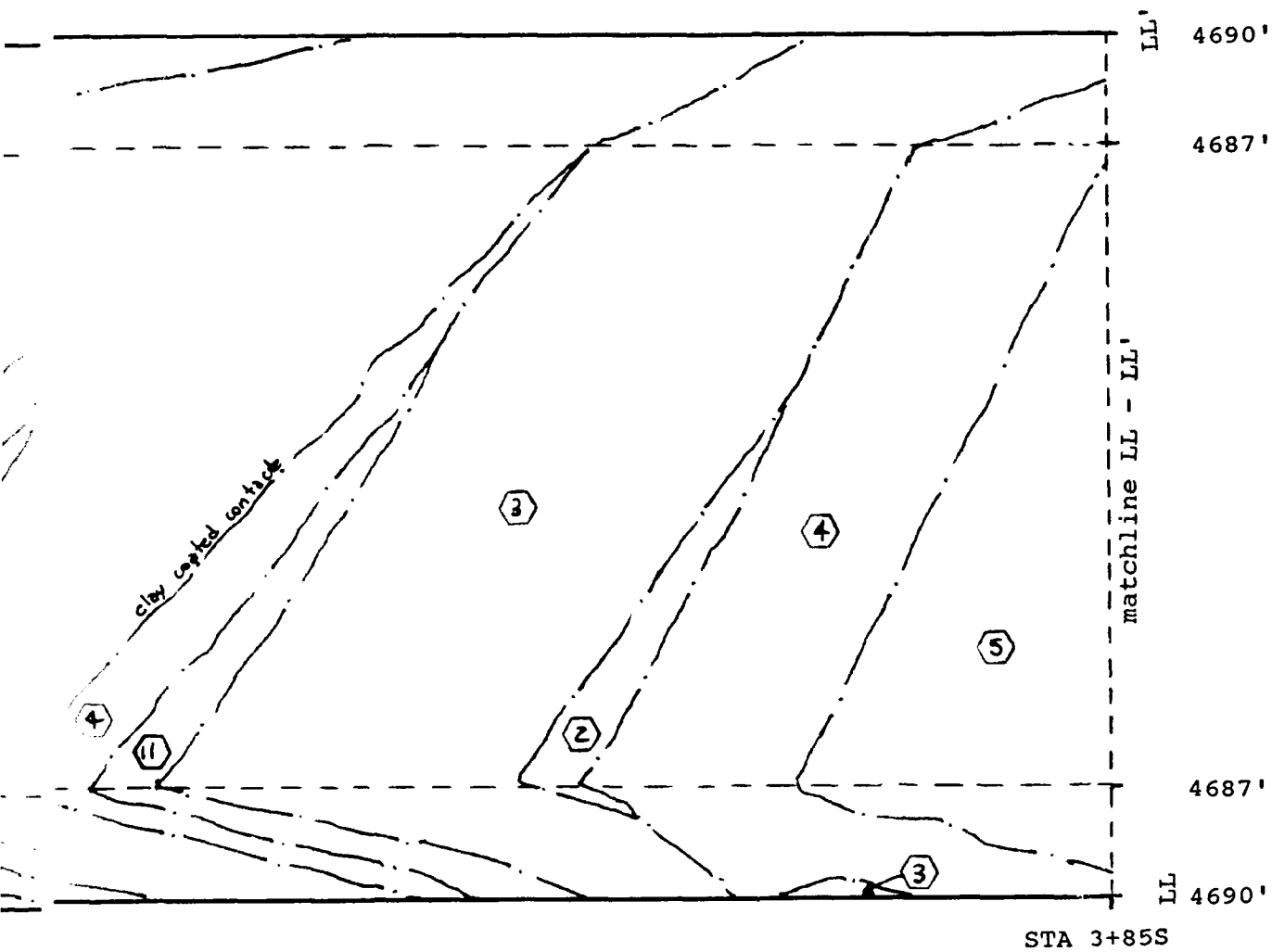






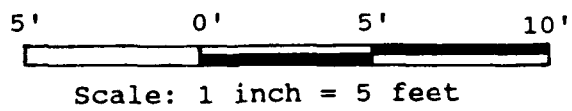
STA 3+25S

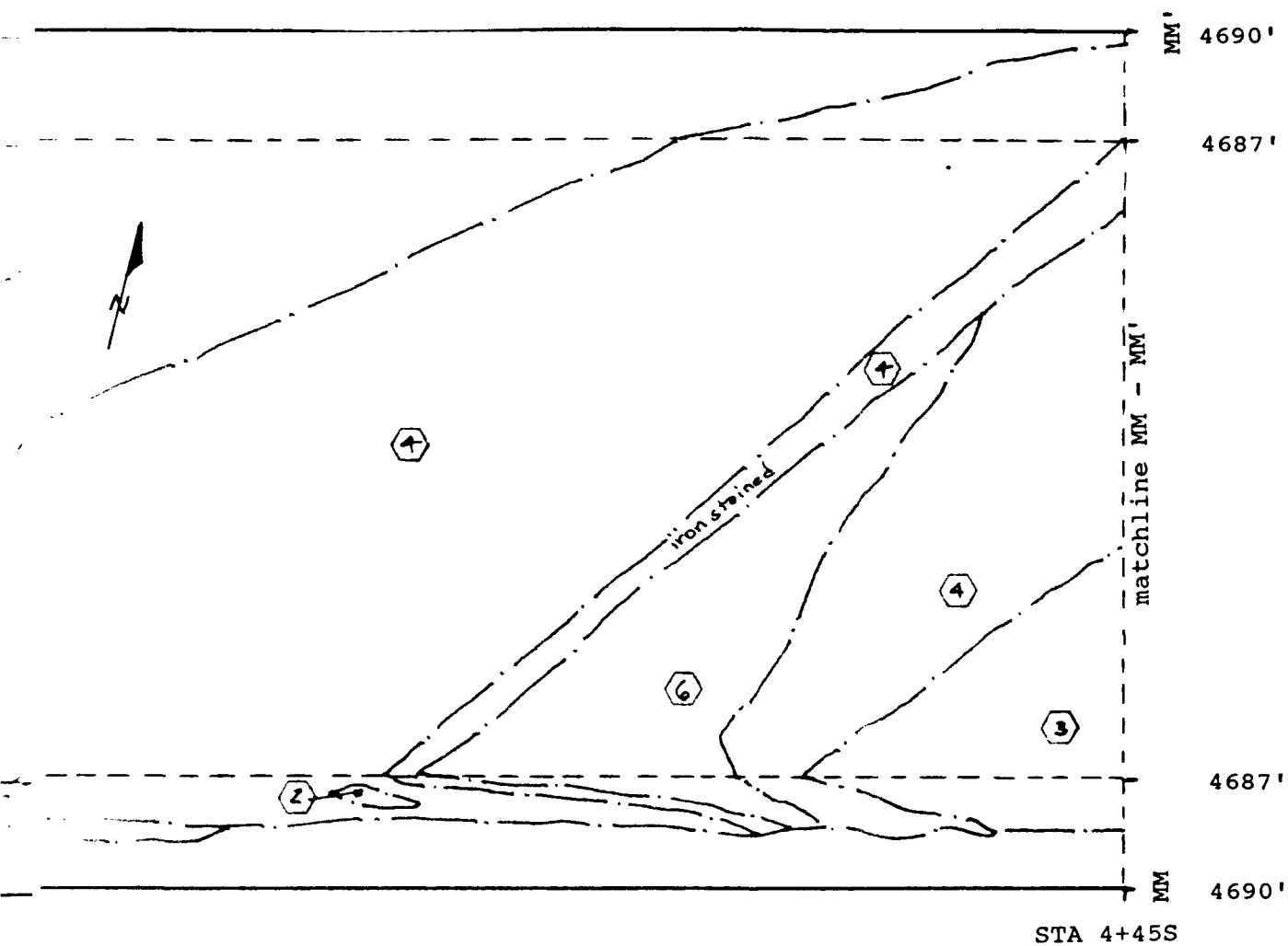
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CAD	DIVISION & TERRITORY TOWN OF COLUMBIAS, N.M.	
SUB. BY CAD	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY WSS	AUXILIARY SPILLWAY CHUTE TOE STA 3+25S to STA 3+85S	
DATE: <i>Oct 92</i> <i>David E. Wright</i>		Plate No. D-55





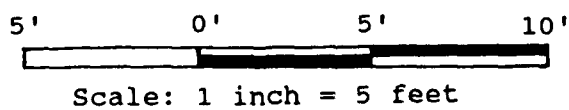
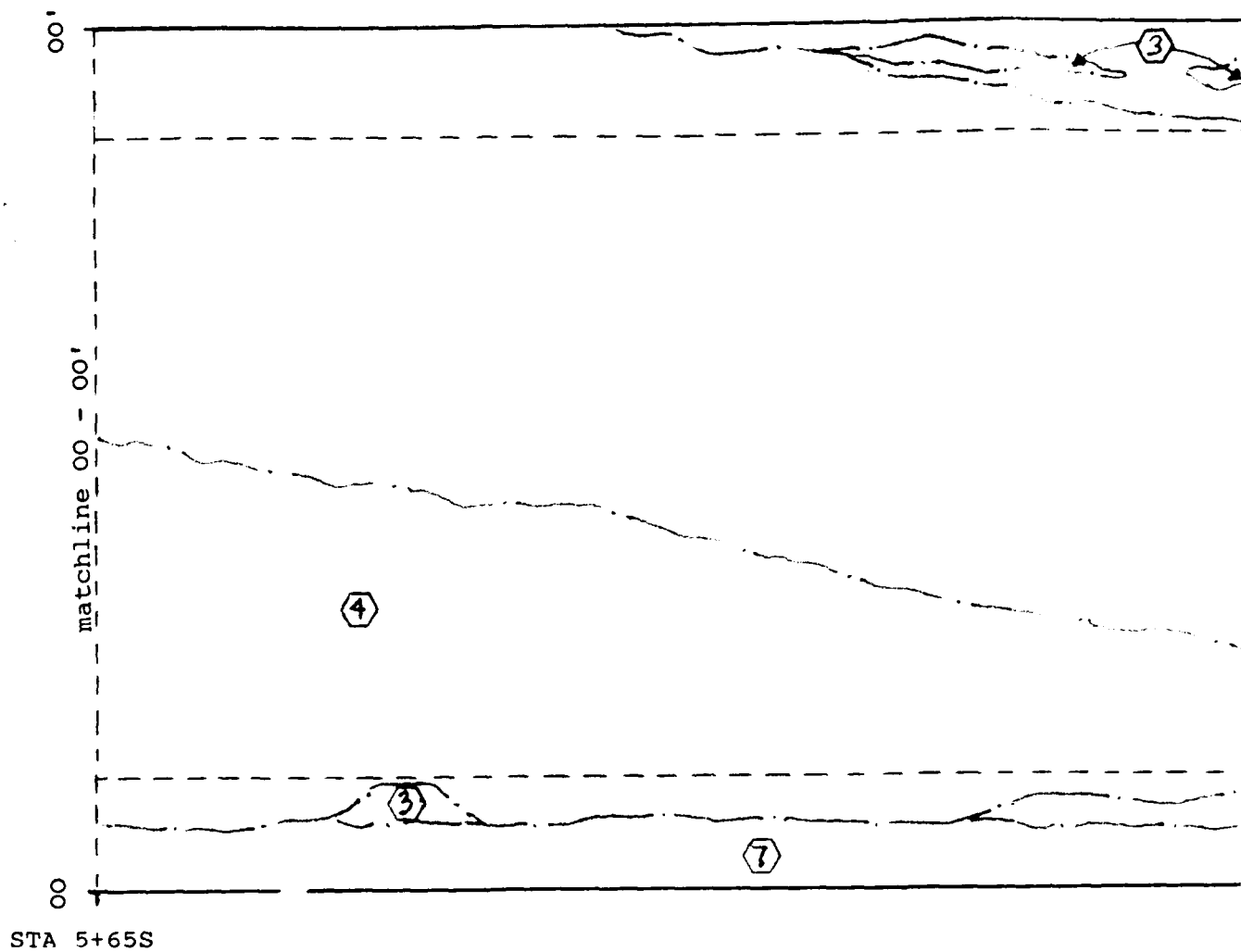


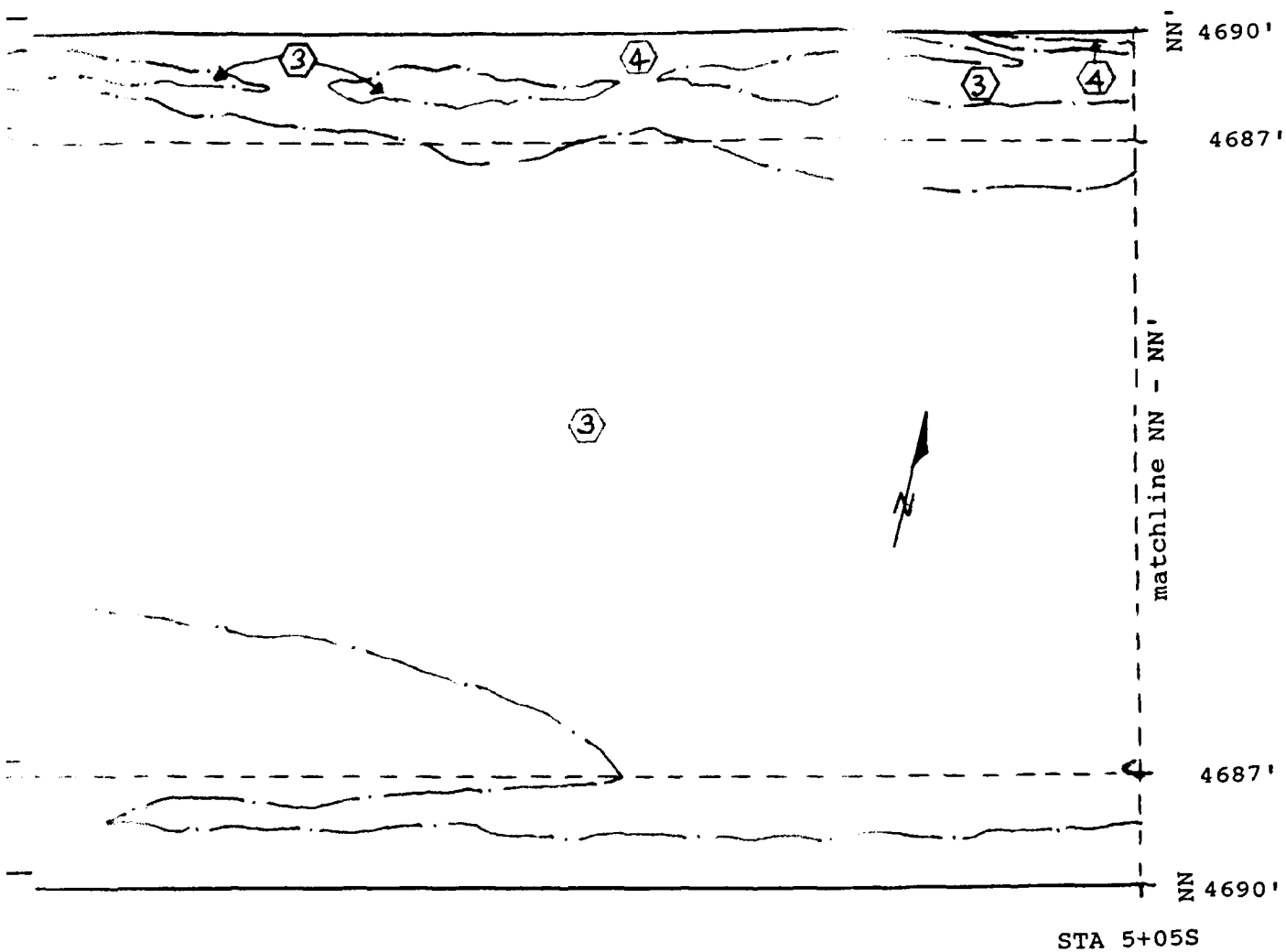
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CSD	250 GRADES & TIE/FASTEN TENTS OR CHANGES, U.S.	
DES. BY CSD	CUCHILLO NEGRO DAM Foundation Square	
CHK. BY W79	FOUNDATION MAP AUXILIARY SPILLWAY CHUTE FOR STA 3+855 to STA 4+458	
David E. Wright DATE: 6-27-92		Plate No. D-56





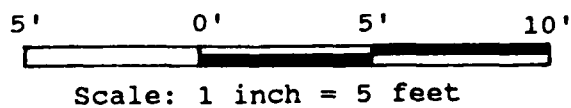
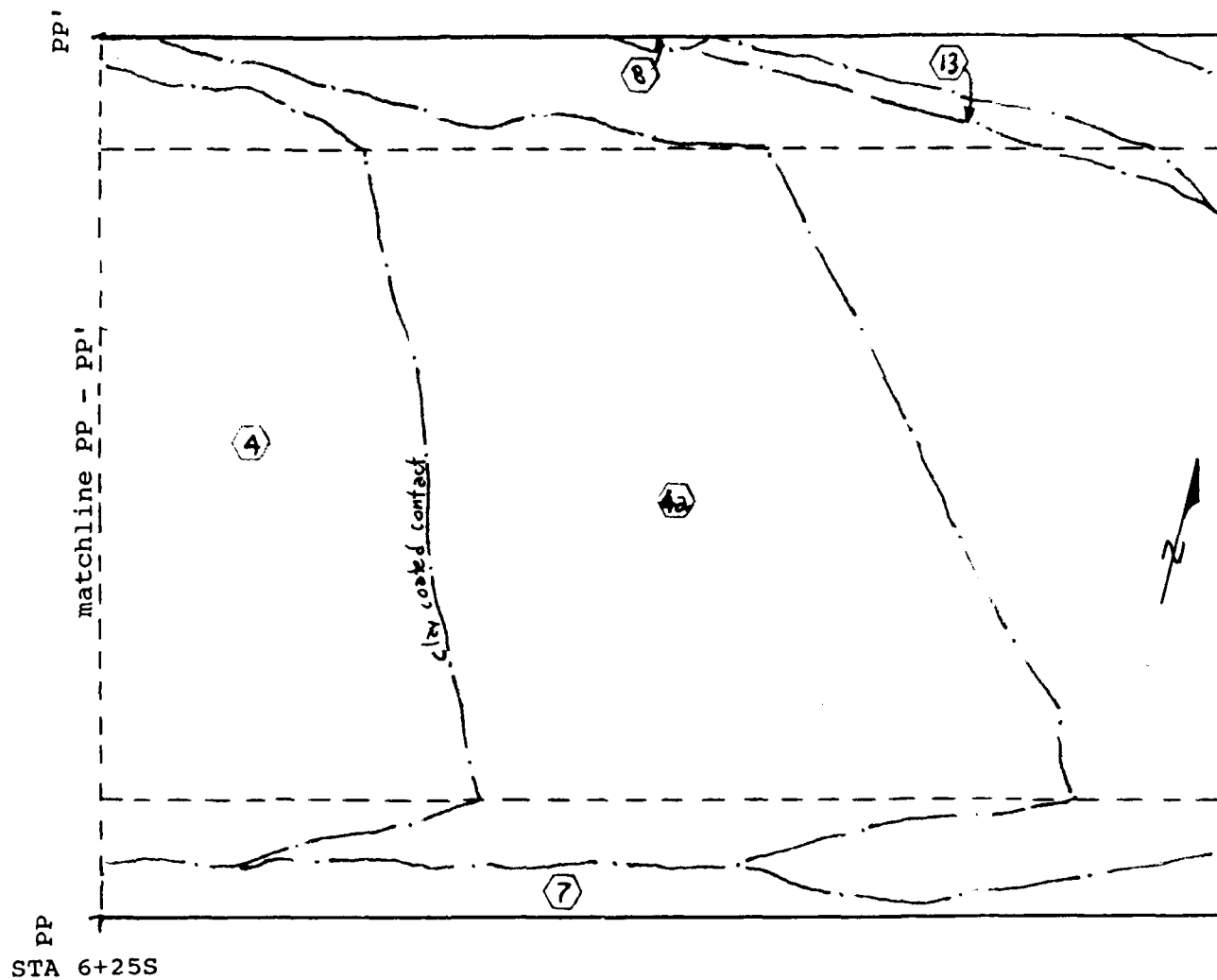


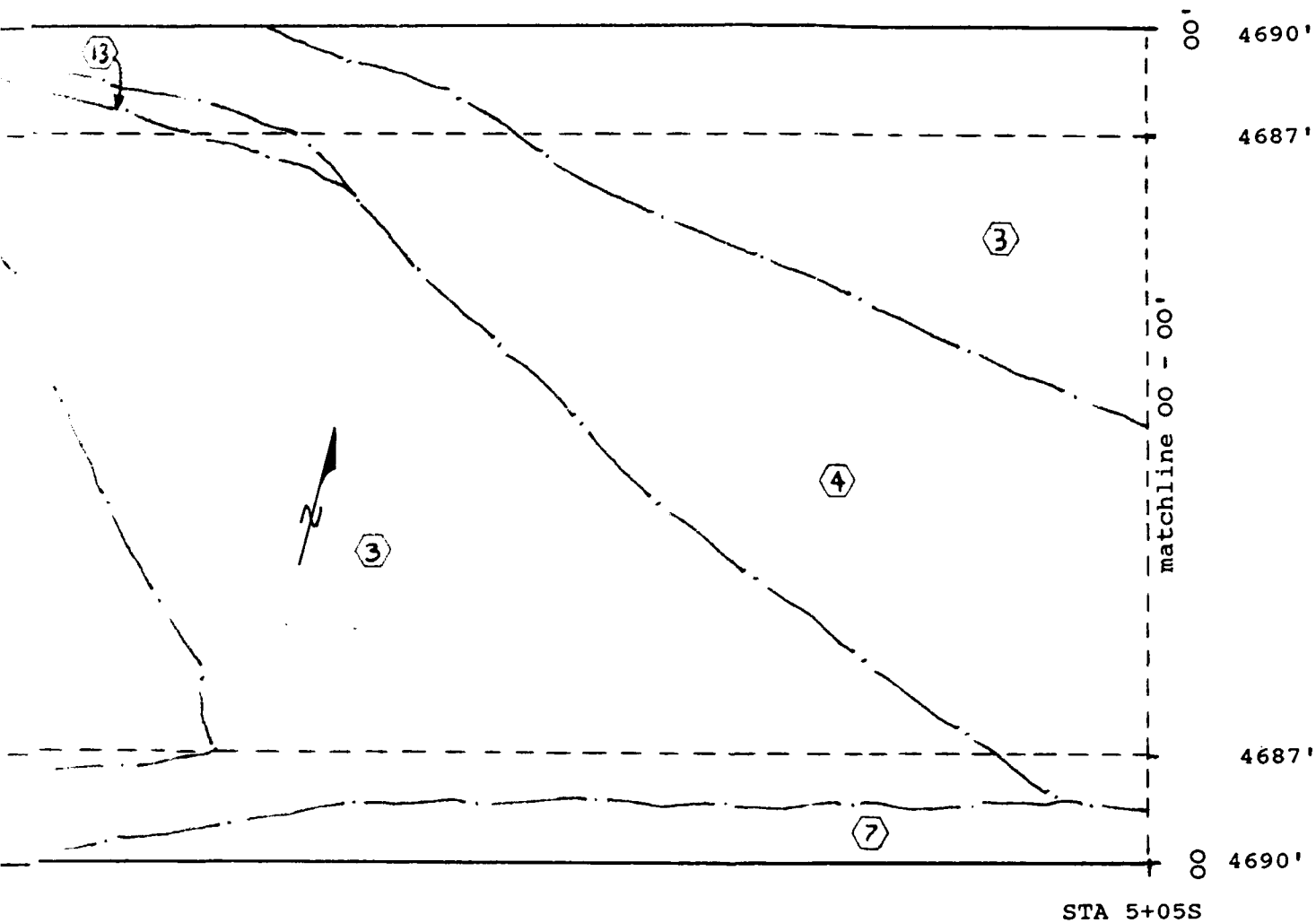
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico.		
DES. BY <u>CAD</u>	R10 GRABER & TRIMMABER TENTS OR CONDUITS, U.S.	
DWG. BY <u>CAD</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <u>WSB</u>	AUXILIARY SPILLWAY CHUTE TOE STA 4+45S TO STA 5+05S	
DATE: <u>Oct 92</u>		Plate No. D-57





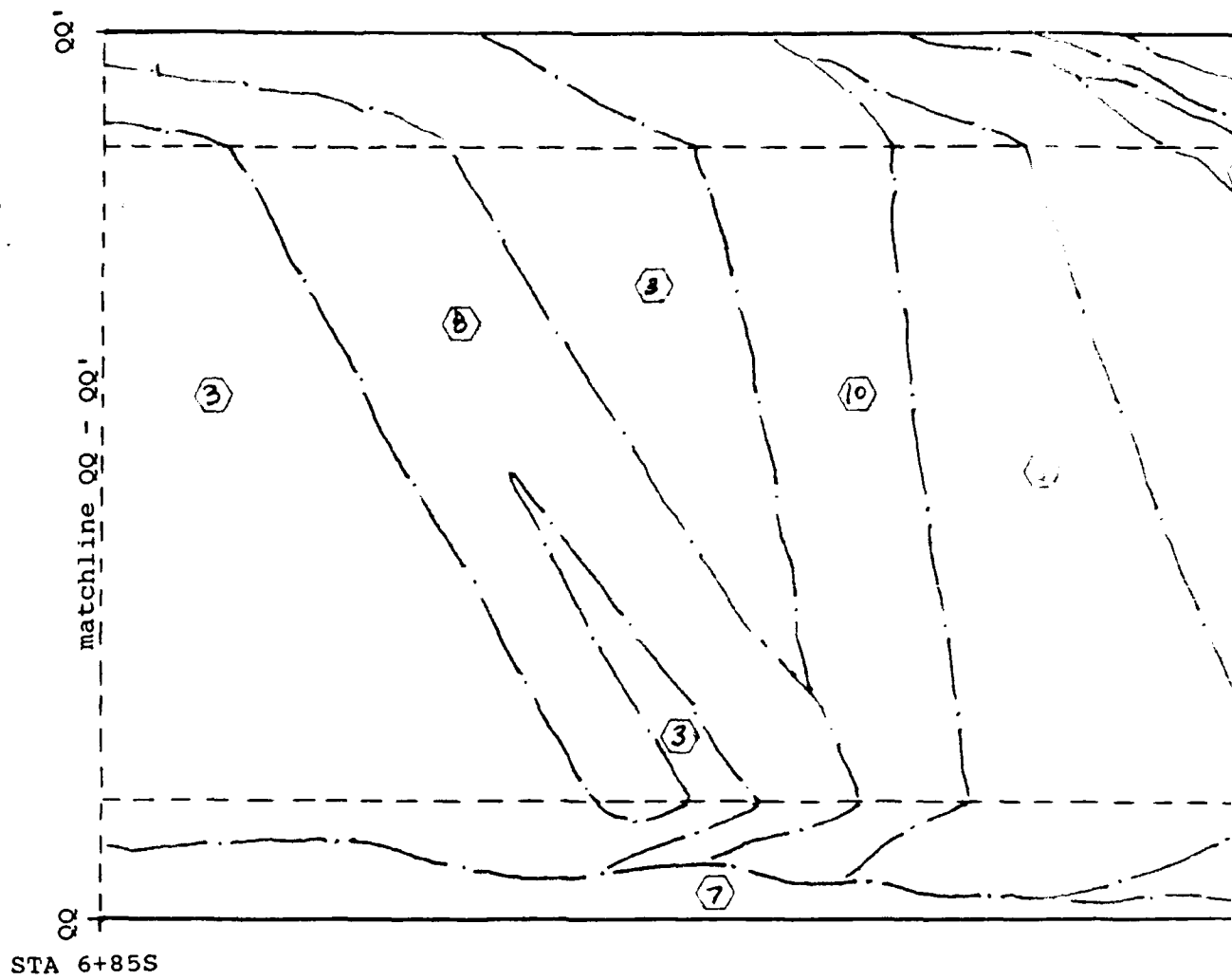


 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	DIO GRADE & TRIBUTARIES TENTS OR CONDUITS, E.C.	
DRAWN BY <u>CAD</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHE. BY <u>W.S.</u>	AUXILIARY SPILLWAY CHUTE TOE STA 5+05S to STA 5+65S	
ENGINEER <u>David E. Wright</u> DATE: <u>6 Oct 92</u>		Plate No. D-58



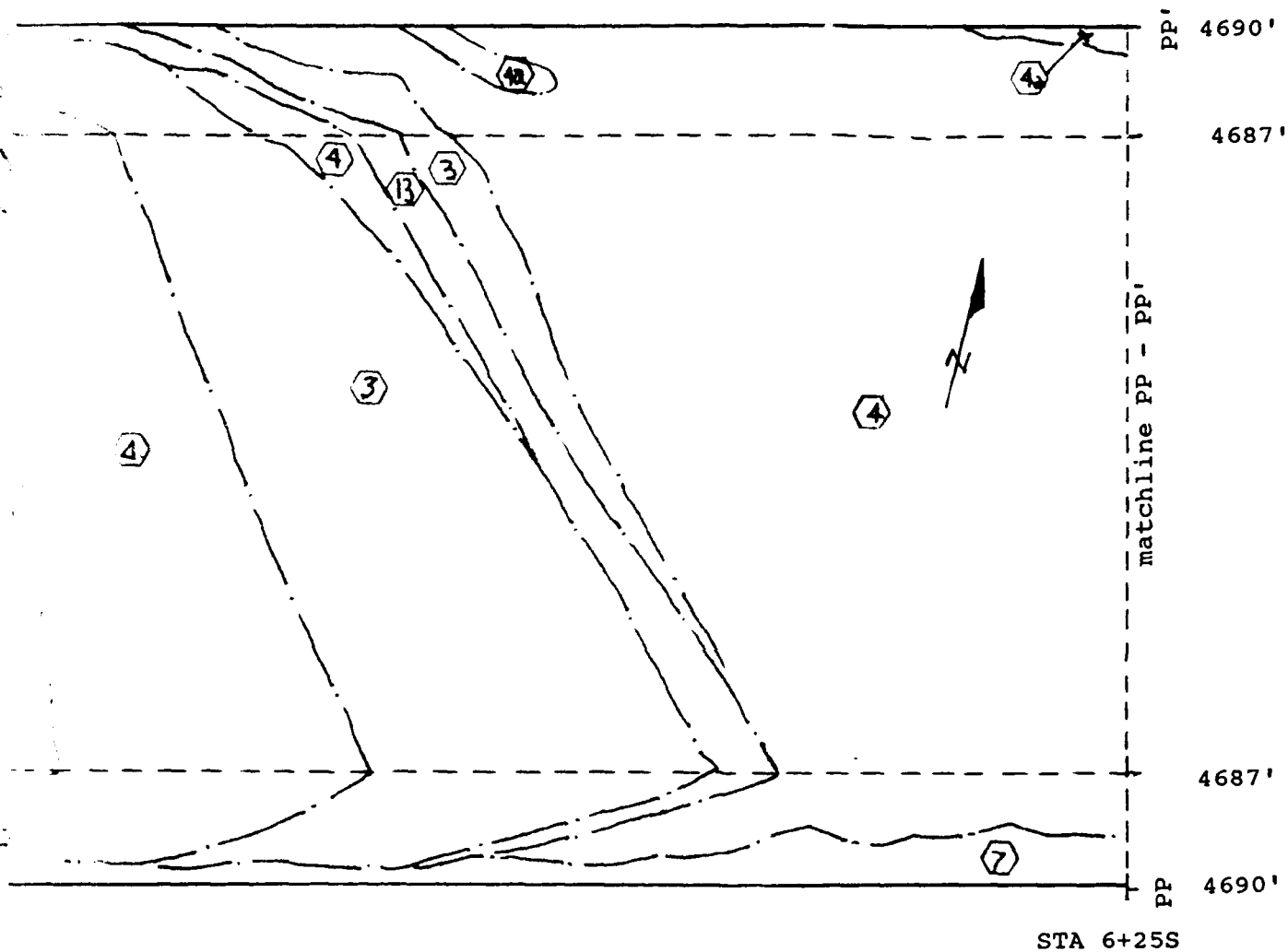




 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	TITLE OR COMMENTARY, E.N. CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <u>WSB</u>	AUXILIARY SPILLWAY CHUTE TOE STA 5+655 to STA 6+255	
DATE: <u>6 Oct 72</u> BY: <u>David E. Wright</u>		Plate No. D-59

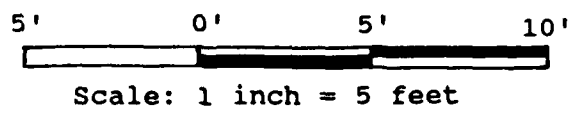
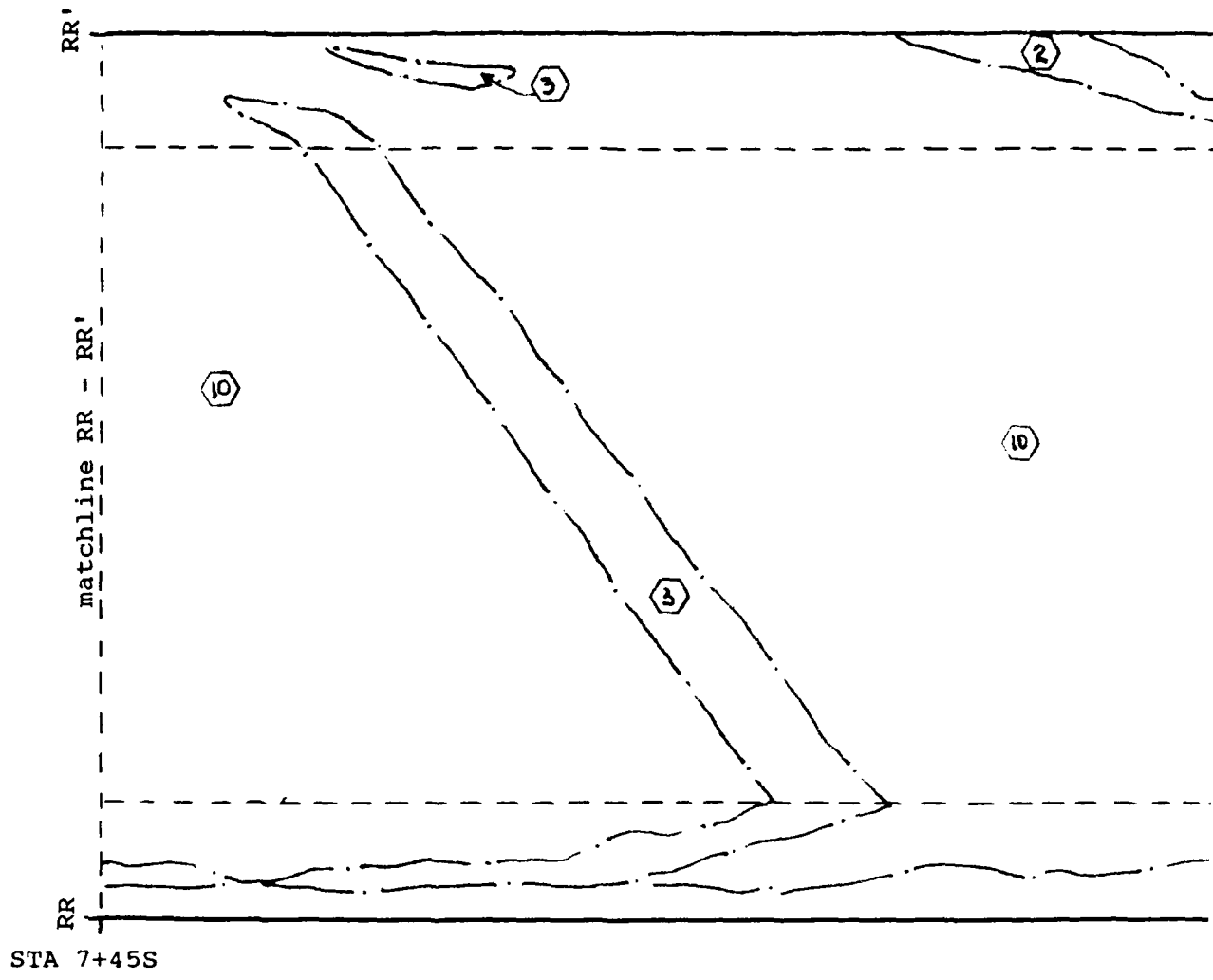


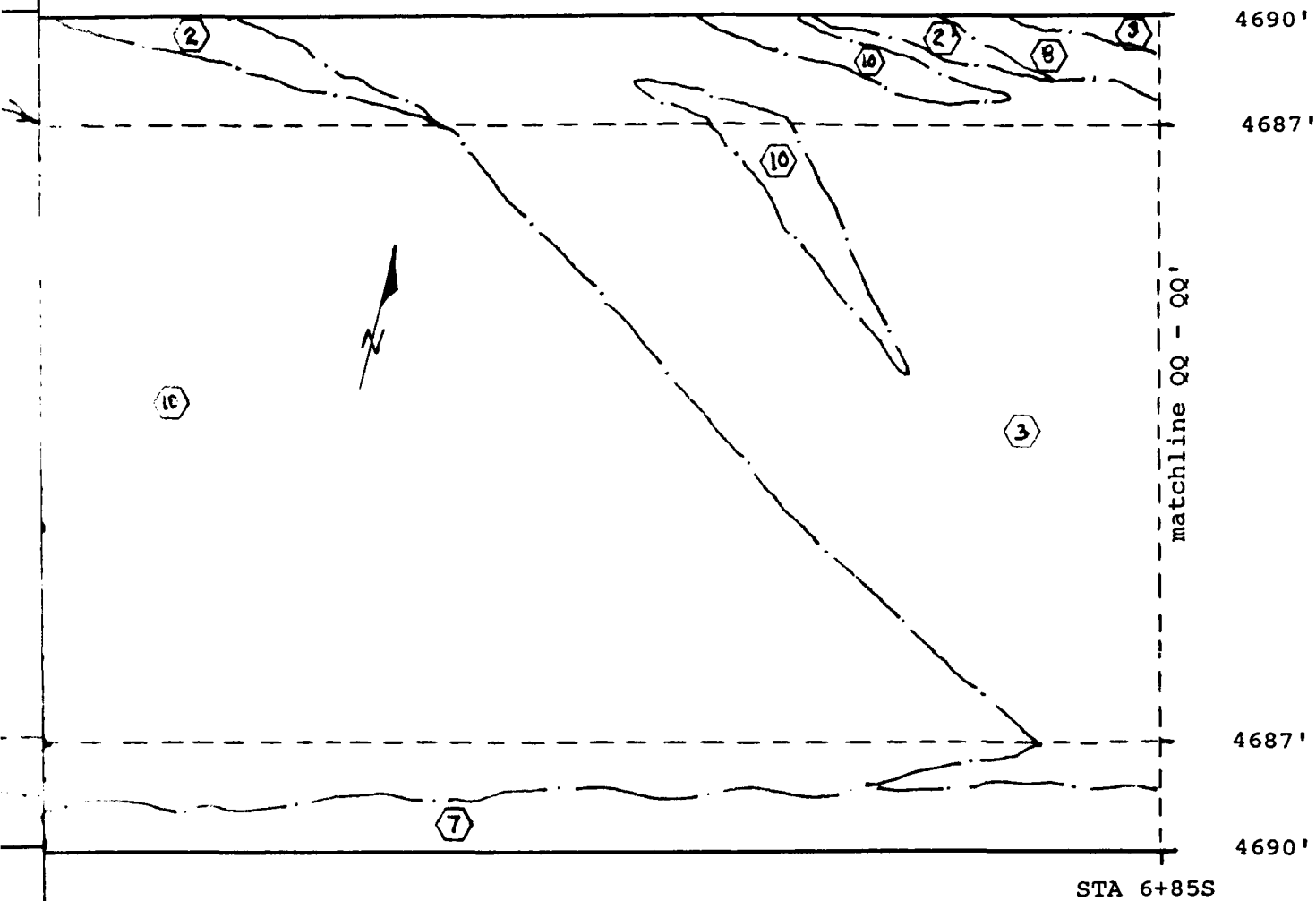
5' 0' 5' 10'



Scale: 1 inch = 5 feet

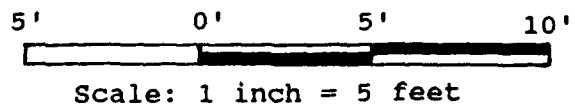
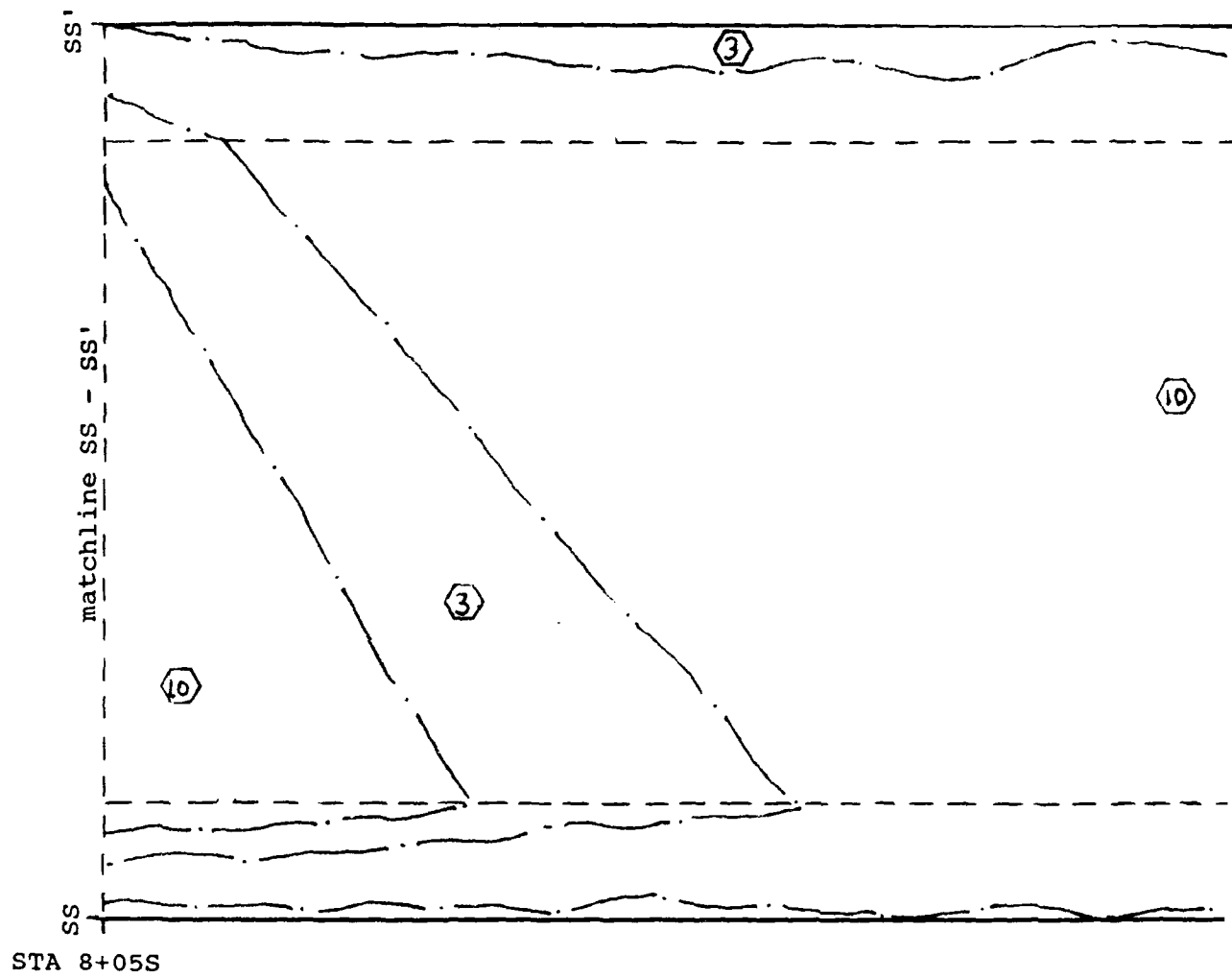


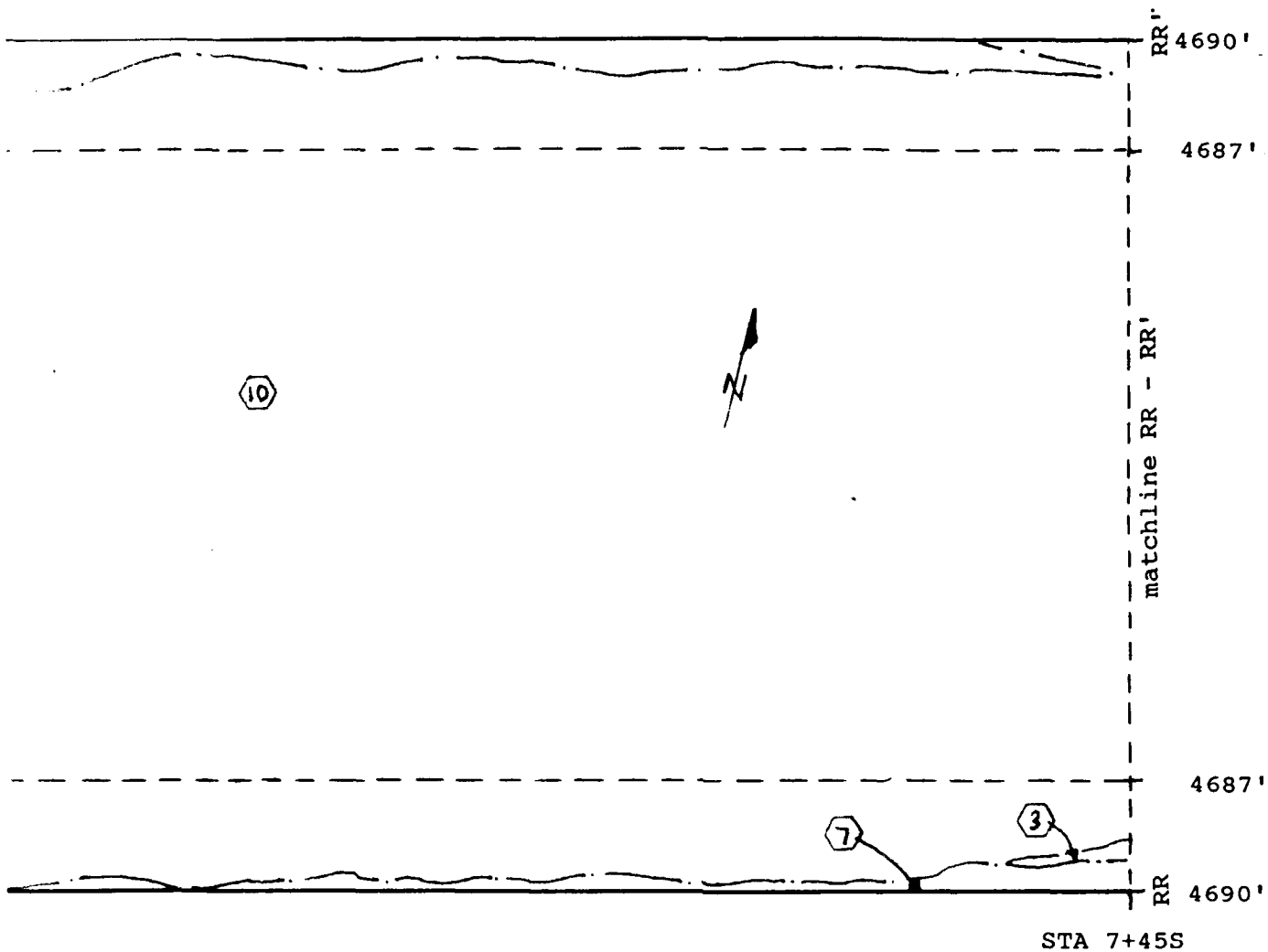
 U. S. ARMY ENGINEER DISTRICT. ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CSD</u>	010 GRADE & TIE/STATIONS	
PAR. BY <u>CSD</u>	COCHILLO NEGRO DAM	
CHK. BY <u>W56</u>	Foundation Report FOUNDATION MAP	
AUXILIARY SPILLWAY CHUTE TOE STA 6+25S to STA 6+85S		Plate No. D-60
DATE: <u>6 Oct 92</u>		





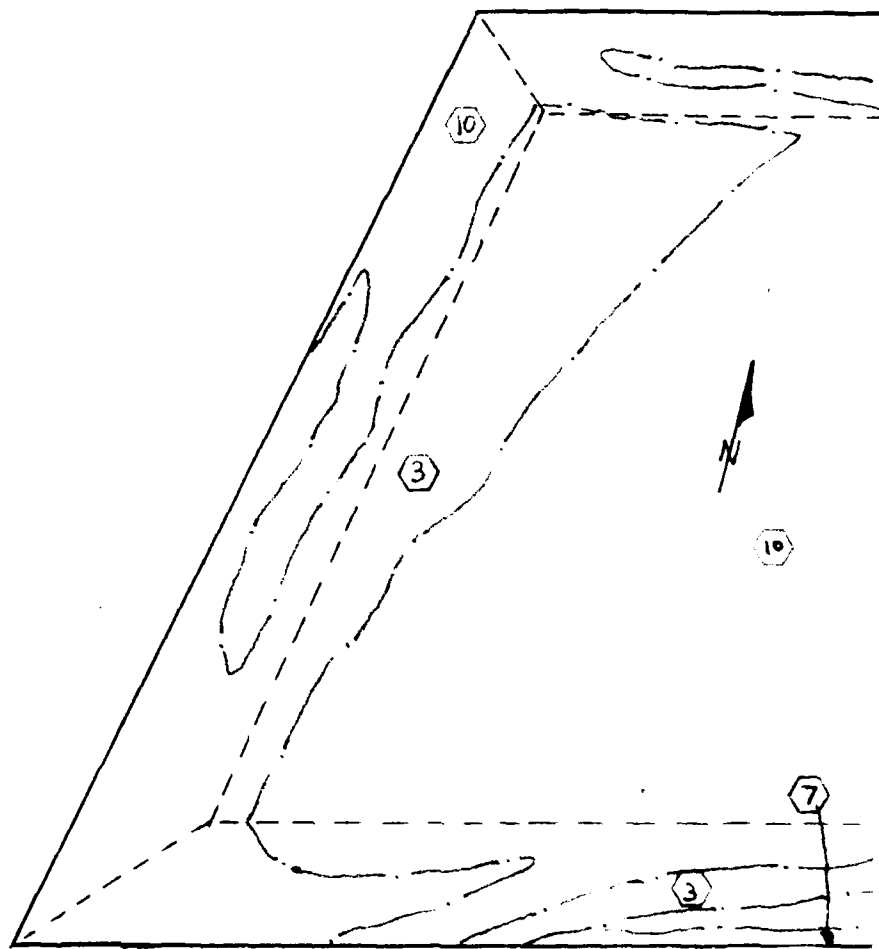


 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico			
DES. BY <i>CSD</i>	510 GRADES & TIEPOINTS TENTS OR CONDUITS, U.S.		
DES. BY <i>CSD</i>	COCHILLO NEGRO DAM Foundation Report		
CHK. BY <i>W-6</i>	FOUNDATION MAP AUXILIARY SPILLWAY GRUTE FOR STA 6+85S TO STA 7+45S		
DATE: <i>6 Oct 92</i> <i>David E. Wright</i>		Plate No. D-61	





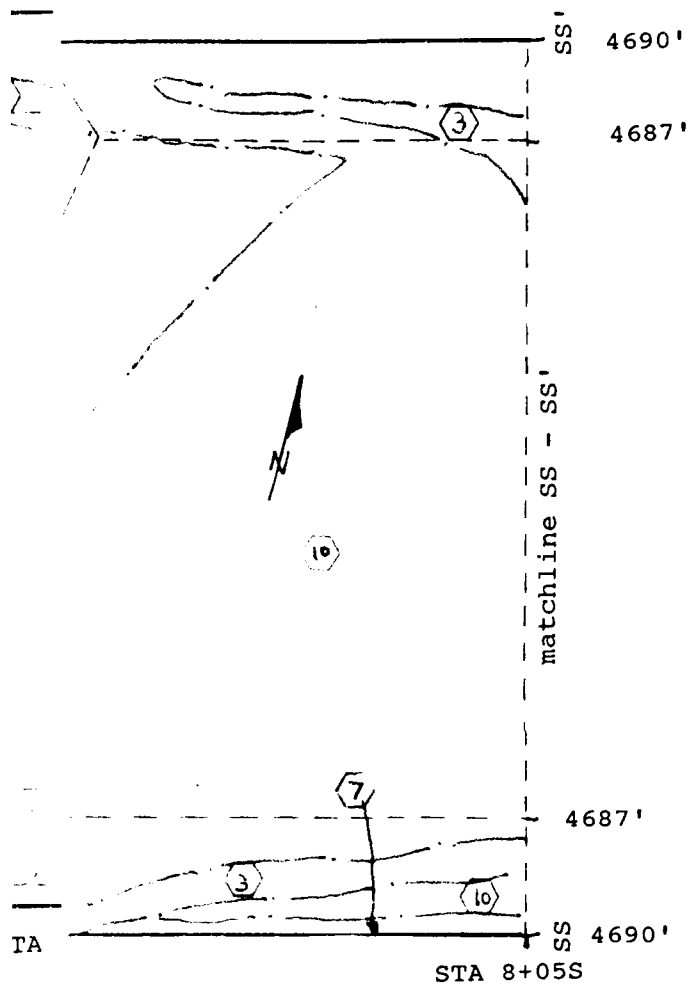
 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY <u>CAD</u>	DTG CHANGE & TRIMMINGS TENTS OR CONDUITS, N.A.	
CHK. BY <u>CAD</u>	CUCHILLO NEGRO DAM Foundation Report FOUNDATION MAP	
CHK. BY <u>WSB</u>	AUXILIARY SPILLWAY CHUTE TO STA 7+45S to STA 8+05S	
ENGINEER <u>David E. Wright</u> DATE: <u>6 Oct 92</u>		Plate No. D-52





STA 8+30S



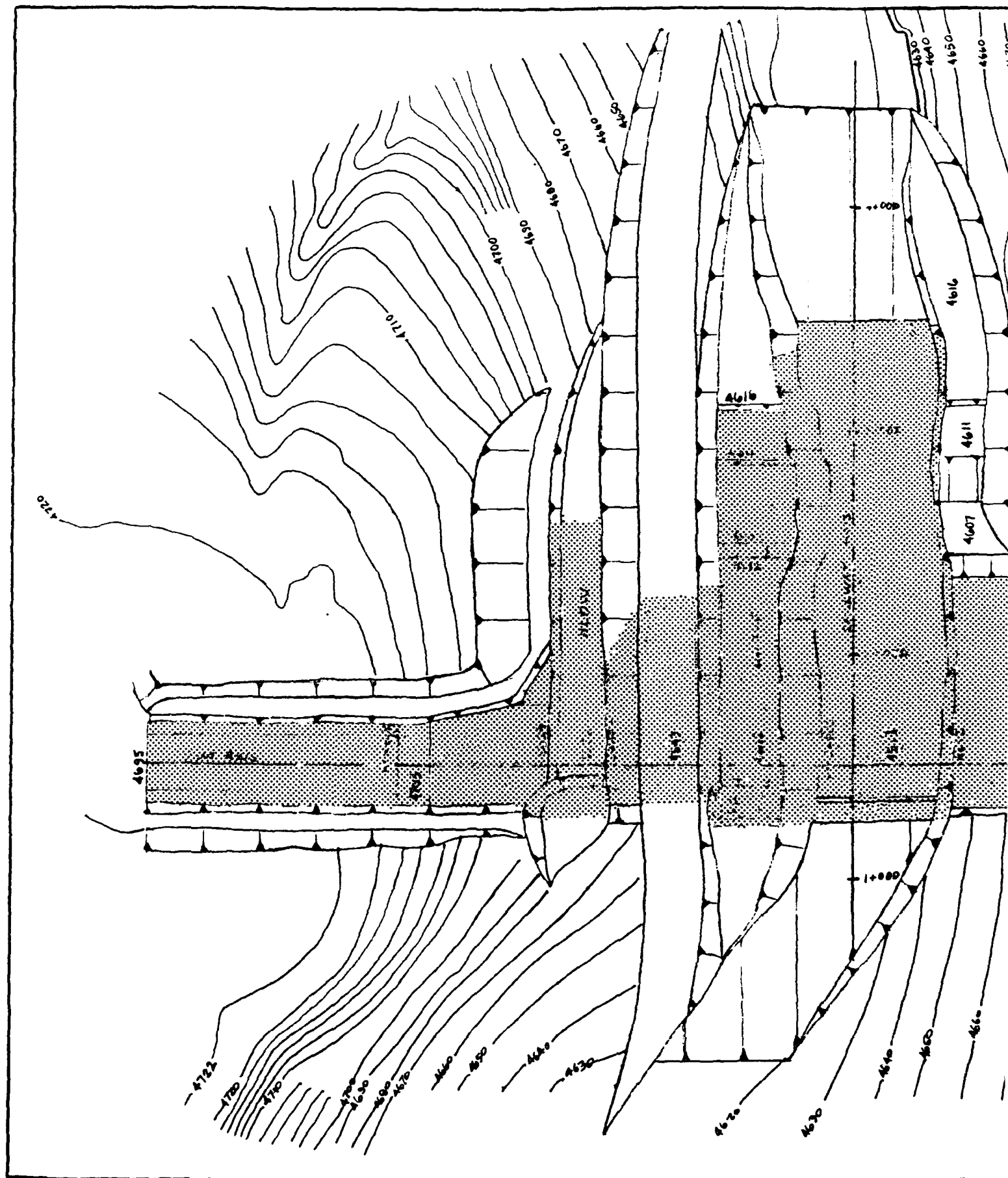
Scale: 1 inch = 5 feet



 U. S. ARMY ENGINEER DISTRICT, ALBUQUERQUE Albuquerque, New Mexico		
DES. BY CND	RIO GRANDE & TRIBUTARIES TRUTH OR CONSEQUENCE: N N	
DUR. BY CND	CUCHILLO NEGRO DAM Foundation Report	
CHK. BY WSD	FOUNDATION MAP AUXILIARY SPILLWAY CHUTE TOE STA 8+05S to STA 8+	
DATE: 6 Oct 92		Plate No. D-63

D-69

RCC Dam Foundation Mapped



Note: Shaded area represents that portion of the excavation which was mapped.

